

SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
(Autonomous)
Gobichettipalayam, Erode-638455



Regulation 2023 (Autonomous)
Curriculum and Syllabus
Choice Based Credit System (CBCS)
BE – CIVIL ENGINEERING



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
(Autonomous)

Gobichettipalayam, Erode - 638455

Regulation 2023 (UG)
Curriculum and Syllabus
BE-Civil Engineering

I. Program Educational Objective (PEO)

- PEO1: Successful Careers :** Gain knowledge and skills in Civil engineering which will enable them to have a career and professional accomplishment in the public or private sector organizations
- PEO2: Complex Problem Solving:** Become consultants on complex real life Civil Engineering problems related to Infrastructure development especially housing, construction, water supply, sewerage, transport, spatial planning.
- PEO3: Technical Solutions:** Become entrepreneurs and develop processes and technologies to meet desired infrastructure needs of society and formulate solutions that are technically sound, Economically feasible, and socially acceptable.
- PEO4: Research Investigation:** Perform investigation for solving Civil Engineering problems by conducting research using modern equipment and software tools.
- PEO5: Multi-disciplinary Function:** Function in multi-disciplinary teams and advocate policies, systems, processes and equipment to support civil engineering

II. Program Outcomes (POs)

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Signature
Chairman
BoS / Civil

5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

III. Program Specific Outcomes (PSOs)

PSO1: Knowledge of Civil Engineering discipline

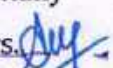
Demonstrate in-depth knowledge of Civil Engineering discipline, with an ability to evaluate, analyze and synthesize existing and new knowledge.

PSO2: Critical analysis of Civil Engineering problems and innovation

Critically analyze complex Civil Engineering problems, apply independent judgment for synthesizing information and make innovative advances in a theoretical, practical and policy context.


PSO3: Conceptualization and evaluation of engineering solutions to Civil Engineering

Issues Conceptualize and solve Civil Engineering problems, evaluate potential solutions and arrive at technically feasible, economically viable and environmentally sound solutions with due consideration of health, safety, and socio cultural factors.


Chairman
BoS / Civil

Mapping of Course Outcome and Programme Outcome																	
Year	Sem	Course name	PO												PSO		
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
I		Professional English - I	-	-	-	2	-	1	-	-	2	3	-	3	-	-	-
		Matrices and Calculus	3	3	1	1	-	-	-	-	2	-	2	3	-	-	-
		Engineering Physics	3	3	2	1	2	-	-	-	-	-	-	1	-	-	-
		Engineering Chemistry	3	2	2	1	1	2	3	-	-	-	-	1	-	-	-
		Problem Solving and Python Programming	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3
		தமிழர் மரபு /Heritage of Tamils	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Problem Solving and Python Programming Laboratory	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3
		Physics and Chemistry Laboratory	3	3	1	1	-	-	-	-	-	-	-	-	-	-	-
			3	2	1	-	1	3	2	1	-	-	-	1	-	-	-
		English Laboratory	-	-	-	-	-	-	-	1	3	3	-	2	-	-	-
II		Professional English - II	-	1	1	-	-	-	1	1	2	3	-	2	-	-	-
		Numerical Methods and Statistics	3	3	1	1	1	-	-	-	2	-	2	3	-	-	-
		Materials Science	3	2	2	1	2	2	2	-	-	-	-	1	-	-	-
		Basic Electrical and Electronics Engineering	3	3	2	2	-	-	-	-	-	1	-	-	-	-	-
		Engineering Graphics	3	1	2	-	2	-	-	-	-	3	-	-	3	3	2
		தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		Engineering Practices Laboratory	3	2	-	-	1	1	1	-	-	-	-	2	-	-	-
		Basic Electrical and Electronics Engineering Laboratory	3	3	2	2	-	-	-	-	-	1	-	-	-	-	-
		Communication Laboratory	-	-	2	-	-	-	-	1	3	3	-	3	-	-	-

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS / Civil

Mapping of Course Outcome and Programme Outcome																	
Year	Sem	Course name	PO												PSO		
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
II	III	Transforms and Partial Differential Equations	3	3	1	1	-	-	-	-	2	-	-	3	-	-	-
		Engineering Mechanics	3	2	3	1	2	-	-	-	-	-	-	2	3	1	2
		Fluid Mechanics	3	2	3	2	1	2	2	1	1	1	1	2	3	3	3
		Construction Materials and Technology	2	2	1	2	1	1	2	-	1	-	2	2	3	2	2
		Water Supply and Wastewater Engineering	3	3	3	2	2	3	3	2	2	2	2	3	3	2	2
		Surveying and Levelling	3	2	3	2	3	3	2	2	2	-	2	2	3	3	3
		Entrepreneurship and Startup															
		Surveying and Levelling Laboratory	3	2	3	3	3	3	3	3	3	3	3	1	3	3	3
		Water and Wastewater Analysis Laboratory	2	2	2	2	2	2	2	3	2	2	2	3	2	2	2
	IV	Applied Hydraulics Engineering	3	3	2	3	1	2	2	1	2	1	1	3	3	2	3
		Strength of Materials	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3
		Concrete Technology	3	1	2	2	1	3	3	2	1	1	1	2	3	2	3
		Soil Mechanics	3	3	2	2	2	1	1	1	2	1	2	3	2	2	3
		Highway and Railway Engineering	2	3	3	2	2	3	2	3	2	1	3	3	3	3	2
		Environmental Sciences and Sustainability	3	2	1	1	-	2	2	-	-	-	-	2	-	-	-
		Hydraulic Engineering Laboratory	3	3	2	3	1	2	2	1	2	1	1	2	3	2	1
		Materials Testing Laboratory	3	3	2	3	1	2	2	1	3	1	1	2	3	2	2
		Soil Mechanics Laboratory	1	2	3	3	1	1	1	1	3	1	1	3	2	3	3

dy.
Chairman
BoS / Civil

SUMMARY OF CREDITS

S. No	Course Category	Credits per Semester								Total Credits	Credits in %	Credits as per AU Curriculum	Credits as per AICTE Model Curriculum
		I	II	III	IV	V	VI	VII	VIII				
1	HSS	4	3	-	-	-	-	5	-	12	7.06	12	12
2	BS	12	7	4	2	-	-	-	-	25	14.71	25	26
3	ES	5	11	3	-	-	-	-	-	19	11.18	19	29
4	PC	-	-	16	21	11	11	6	-	65	38.24	65	47
5	PE	-	-	-	-	9	9	-	-	18	10.59	18	23
6	OE	-	-	-	-	-	3	9	-	12	7.06	12	11
7	EEC	1	2	1	-	1	-	4	10	19	11.18	15	12
8	MC		√		√	√	√						
Total Credits / Semester		22	23	24	23	21	23	24	10	170	100	166	160

CATEGORIZATION OF COURSES

- i. Humanities and Social Sciences including Management Courses (HSS)
- ii. Basic Science Courses (BS)
- iii. Engineering Science Courses (ES)
- iv. Professional Core Courses (PC)
- v. Professional Elective Courses (PE)
- vi. Open Elective Courses (OE)
- vii. Mandatory Courses (MC)
- viii. Employability Enhancement Courses (EEC)
- ix. Other Courses (OC)

ENROLLMENT FOR B.E. / B. TECH. (HONOURS) / MINOR DEGREE (OPTIONAL)

A student can also optionally register for additional courses (18 credits) and become eligible for the award of B.E. / B. Tech. (Honours) or Minor Degree.

For B.E. / B. Tech. (Honours), a student shall register for the additional courses (18 credits) from semester V onwards. These courses shall be from the same vertical or a combination of different verticals of the same programme of study only.

For minor degree, a student shall register for the additional courses (18 credits) from semester V onwards. All these courses have to be in a particular vertical from any one of the other programmes.

Chairman
BoS / Civil



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG) Curriculum and Syllabus BE-Civil Engineering

SEMESTER I

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Induction Program											
1.	23IPA11	Induction Programme	-	-	-	-	-	0	-	-	-
Theory											
2.	23ENT11	Professional English - I	HSS	3	0	0	3	3	40	60	100
3.	23MAT11	Matrices and Calculus	BS	3	1	0	4	4	40	60	100
4.	23PHT11	Engineering Physics	BS	3	0	0	3	3	40	60	100
5.	23CYT11	Engineering Chemistry	BS	3	0	0	3	3	40	60	100
6.	23CST11	Problem Solving and Python Programming	ES	3	0	0	3	3	40	60	100
7.	23TAT11	தமிழர் மரபு /Heritage of Tamils	HSS	1	0	0	1	1	40	60	100
Practicals											
8.	23CSL11	Problem Solving and Python Programming Laboratory	ES	0	0	4	4	2	60	40	100
9.	23PCL11	Physics and Chemistry Laboratory	BS	0	0	4	4	2	60	40	100
10.	23ENL11	English Laboratory	EEC	0	0	2	2	1	60	40	100
Total				16	1	10	27	22			


Chairman
BoS / Civil



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

**Regulation 2023 (UG)
Curriculum and Syllabus
BE-Civil Engineering**

SEMESTER II

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23ENT21	Professional English - II	HSS	2	0	0	2	2	40	60	100
2.	23MAT21	Numerical Methods and Statistics	BS	3	1	0	4	4	40	60	100
3.	23PHT22	Materials Science	BS	3	0	0	3	3	40	60	100
4.	23EET22	Basic Electrical and Electronics Engineering	ES	3	0	0	3	3	40	60	100
5.	23MET21	Engineering Graphics	ES	2	0	4	6	4	40	60	100
6.	23TAT21	தமிழரும் தொழில்நுட்பமும் /Tamil and Technology	HSS	1	0	0	1	1	40	60	100
Practicals											
7.	23MEL21	Engineering Practices Laboratory	ES	0	0	4	4	2	60	40	100
8.	23EEL22	Basic Electrical and Electronics Engineering Laboratory	ES	0	0	4	4	2	60	40	100
9.	23ENL21	Communication Laboratory	EEC	0	0	4	4	2	60	40	100
Mandatory Courses											
10.	23MDC21	Mandatory Course - I&	MC	0	0	1	1	0	100	-	100
Total				14	1	17	32	23			

& Mandatory Course-I

Yoga for Human Excellence

Non - Credit Course

dy.
Chairman
BoS / Civil



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG) Curriculum and Syllabus BE-Civil Engineering

SEMESTER III

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23MAT32	Transforms and Partial Differential Equations	BS	3	1	0	4	4	40	60	100
2.	23MET31	Engineering Mechanics	ES	3	0	0	3	3	40	60	100
3.	23CET31	Fluid Mechanics	PC	3	0	0	3	3	40	60	100
4.	23CET32	Construction Materials and Technology	PC	3	0	0	3	3	40	60	100
5.	23CET33	Water Supply and Wastewater Engineering	PC	4	0	0	4	4	40	60	100
6.	23CET34	Surveying and Levelling	PC	3	0	0	3	3	40	60	100
7.	23EST31	Entrepreneurship and Startup	EEC	0	0	2	2	1	100	-	100
Practicals											
8.	23CEL31	Surveying and Levelling Laboratory	PC	0	0	3	3	1.5	60	40	100
9.	23CEL32	Water and Wastewater Analysis Laboratory	PC	0	0	3	3	1.5	60	40	100
Total				19	1	8	28	24			

Prof.
Chairman
BoS / Civil



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG)
Curriculum and Syllabus
BE-Civil Engineering

SEMESTER IV

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23CET41	Applied Hydraulics Engineering	PC	3	1	0	4	4	40	60	100
2.	23CET42	Strength of Materials	PC	3	0	0	3	3	40	60	100
3.	23CET43	Concrete Technology	PC	3	0	0	3	3	40	60	100
4.	23CET44	Soil Mechanics	PC	3	0	0	3	3	40	60	100
5.	23CET45	Highway and Railway Engineering	PC	3	0	0	3	3	40	60	100
6.	23CYT41	Environmental Sciences and Sustainability	BS	2	0	0	2	2	40	60	100
Practicals											
7.	23CEL41	Hydraulic Engineering Laboratory	PC	0	0	3	3	1.5	60	40	100
8.	23CEL42	Materials Testing Laboratory	PC	0	0	4	4	2	60	40	100
9.	23CEL43	Soil Mechanics Laboratory	PC	0	0	3	3	1.5	60	40	100
Mandatory Courses											
10.	23MDC41	Soft and Analytical Skills – I&	MC	1	0	0	1	0	-	-	-
Total				18	1	11	29	23			

& Soft and Analytical Skills – I is a Non-credit Course

dyf.
Chairman
BoS / Civil



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

Regulation 2023 (UG)
Curriculum and Syllabus
BE-Civil Engineering

SEMESTER V

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23CET51	Basic Structural Design – I (Concrete)	PC	3	0	0	3	3	40	60	100
2.	23CET52	Structural Analysis I	PC	3	0	0	3	3	40	60	100
3.	23CET53	Foundation Engineering	PC	3	0	0	3	3	40	60	100
4.		Professional Elective I *	PE	-	-	-	-	3	-	-	100
5.		Professional Elective II *	PE	-	-	-	-	3	-	-	100
6.		Professional Elective III *	PE	-	-	-	-	3	-	-	100
Practicals											
7.	23CEL51	Highway Engineering Laboratory	PC	0	0	4	4	2	60	40	100
8.	23CEL52	Survey Camp	EEC	0	0	0	0	1	60	40	100
Mandatory Courses											
9.		Mandatory Course – II&	MC	3	0	0	3	0	100	-	100
10.	23MDC51	Soft and Analytical Skills – II&&	MC	1	0	0	1	0	-	-	-
Total				-	-	-	-	21			

* Professional Elective – I to III shall be chosen from the list of Professional electives (Verticals) offered by same Programme

& Mandatory Course-II is a Non-credit Course (Student shall select one course from the list given under Mandatory Course-II)

&& Soft and Analytical Skills – II is a Non-credit Course

dy.
Chairman
BoS / Civil


SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE
(Autonomous)
Gobichettipalayam, Erode -638455
**Regulation 2023 (UG)
Curriculum and Syllabus
BE-Civil Engineering**
SEMESTER VI

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23CET61	Basic Structural Design - II (Steel)	PC	3	0	0	3	3	40	60	100
2.	23CET62	Structural Analysis II	PC	3	0	0	3	3	40	60	100
3.	23CET63	Engineering Geology	PC	3	0	0	3	3	40	60	100
4.		Professional Elective IV *	PE	-	-	-	-	3	-	-	100
5.		Professional Elective V *	PE	-	-	-	-	3	-	-	100
6.		Professional Elective VI *	PE	-	-	-	-	3	-	-	100
7.		Open Elective - I**	OE	-	-	-	-	3	-	-	100
Practicals											
8.	23CEL61	Building Drawing and Detailing Laboratory	PC	0	0	4	4	2	60	40	100
Mandatory Courses											
9.		Mandatory Course - III&	MC	3	0	0	3	0	100	-	100
Total				-	-	-	-	23			

* Professional Elective - IV to VI shall be chosen from the list of Professional electives (Verticals) offered by same Programme

** Open Elective - I shall be chosen from the list of open electives offered by other Programmes

& Mandatory Course-III is a Non-credit Course (Student shall select one course from the list given under Mandatory Course-III)

@ The students individually undergo training in reputed firms/ Research institutes / laboratories for the specified duration (04 Weeks) during VI semester summer vacation. After completion of training, a detailed report should be submitted within ten days from the commencement of VII semester.

dy.
Chairman
BoS / Civil


SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

**Regulation 2023 (UG)
Curriculum and Syllabus
BE-Civil Engineering**
SEMESTER VII

S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Theory											
1.	23CET71	Estimation, Costing and Valuation Engineering	PC	3	0	0	3	3	40	60	100
2.	23CET72	Hydrology and Water Resources Engineering	PC	3	0	0	3	3	40	60	100
3.	23UHV71	Human Values and Ethics	HSS	2	0	0	2	2	40	60	100
4.		Elective – Management [#]	HSS	3	0	0	3	3	40	60	100
5.		Open Elective – II**	OE	-	-	-	-	3	40	60	100
6.		Open Elective – III**	OE	-	-	-	-	3	40	60	100
7.		Open Elective – IV**	OE	-	-	-	-	3	40	60	100
Practicals											
8.	23CEL71	Design Project	EEC	0	0	4	4	2	40	60	100
9.	23CEL72	Summer Internship [@]	EEC	0	0	0	0	2	100	-	100
Total				-	-	-	-	24			

[#] Elective - Management shall be chosen from the list of Elective Management courses

^{**} Open Elective – II to IV shall be chosen from the list of open electives offered by other Programmes

[@] The students undergone summer internship during VI semester summer vacation and same will be evaluated in VII semester.

dy.
Chairman
BoS / Civil



SHREE VENKATESHWARA HI-TECH ENGINEERING COLLEGE

(Autonomous)

Gobichettipalayam, Erode -638455

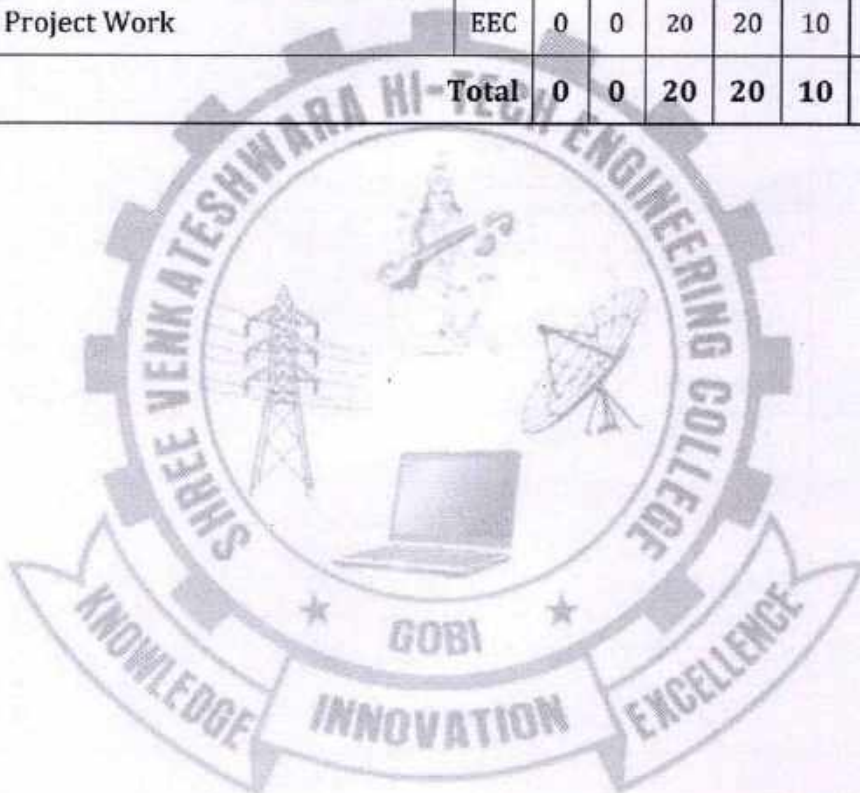
Regulation 2023 (UG)

Curriculum and Syllabus

BE-Civil Engineering

SEMESTER VIII

SEMESTER VIII											
S.No	Course Code	Course Title	Category	Periods / Week			Total Contact Period	Credits	Max.Marks		
				L	T	P			CA	ES	TM
Practicals											
1.	23CEL81	Project Work	EEC	0	0	20	20	10	40	60	100
Total				0	0	20	20	10			



Def.

Chairman
BoS / Civil

MANDATORY COURSES II

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MCT51	Introduction to Women and Gender Studies	MC	3	0	0	3	0	100	-	100
2.	23MCT52	Elements of Literature	MC	3	0	0	3	0	100	-	100
3.	23MCT53	Film Appreciation	MC	3	0	0	3	0	100	-	100
4.	23MCT54	Disaster Risk Reduction and Management	MC	3	0	0	3	0	100	-	100

MANDATORY COURSES III

S. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MCT61	Well Being with Traditional Practices - Yoga, Ayurveda and Siddha	MC	3	0	0	3	0	100	-	100
2.	23MCT62	History of Science and Technology in India	MC	3	0	0	3	0	100	-	100
3.	23MCT63	Political and Economic Thought for a Humane Society	MC	3	0	0	3	0	100	-	100
4.	23MCT64	State, Nation Building and Politics in India	MC	3	0	0	3	0	100	-	100
5.	23MCT65	Industrial Safety	MC	3	0	0	3	0	100	-	100

ELECTIVE - MANAGEMENT COURSES

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23MSE71	Principles of Management	HSS	3	0	0	3	3	40	60	100
2.	23MSE72	Total Quality Management	HSS	3	0	0	3	3	40	60	100
3.	23MSE73	Engineering Economics and Financial Accounting	HSS	3	0	0	3	3	40	60	100
4.	23MSE74	Human Resource Management	HSS	3	0	0	3	3	40	60	100
5.	23MSE75	Knowledge Management	HSS	3	0	0	3	3	40	60	100
6.	23MSE76	Industrial Management	HSS	3	0	0	3	3	40	60	100

dy.
Chairman
BoS / Civil

PROFESSIONAL ELECTIVE COURSES: VERTICALS

VERTICAL I (Structures)	VERTICAL II (Construction techniques and Practices)	VERTICAL III (Geotechnical)	VERTICAL IV (Geo-Informatics)	VERTICAL V (Transportation infrastructure)	VERTICAL VI (Environment)	VERTICAL VII (Water Resources)	VERTICAL VIII (Ocean Engineering)	VERTICAL IX (Diversified Course)
Concrete Structures	Formwork Engineering	Geo- Environmental Engineering	Total Station and GPS Surveying	Airports and Harbours	Climate Change Adaptation and Mitigation	Participatory Water Resources Management	Ocean Wave Dynamics	Steel Concrete Composite Structures
Steel Structures	Construction Equipment and Machinery	Ground Improvemnet Techniques	Remote Sensing Concepts	Traffic Engineering and Management	Air and Noise Pollution Control Engineering	Ground water Engineering	Marine Geotechnical Engineering	Finance For Engineers
Prefabricated Structures	Sustainable Construction and Lean Construction	Soil Dynamicsand Machine Foundations	Satellite Image Processing	Urban Planning and Development	Environmental Impact Assessment	Water Resources Systems Engineering	Coastal Engineering	Earth and Rockfill Dams
Prestressed Concrete Structures	Digitalized Construction Lab	Rock Mechanics	Cartography and GIS	Smart cities	Industrial Wastewater Management	Watershed Conservation and Management	Off shore Structures	Computational Fluid Dynamics
Rehabilitation/ Heritage Restoration	Construction Management and Safety	Earth and Earth Retaining Structures	Photogrammetry	Intelligent Transport Systems	Solid and Hazardous Waste Management	Integrated Water Resources Management	Port and Harbour Engineering	Rainwater Harvesting
Dynamics and Earthquake Resistant Structures	Advanced Construction Techniques	Pile Foundation	Airborne and Terrestrial laser mapping	Pavement Engineering	Environmental Policy and Legislations	Urban Water Infrastructure	Coastal Hazards and Mitigation	Transport and Environment
Introduction to Finite Element Method	Energy Efficient Buildings	Tunneling Engineering	Hydrographic Surveying	Transportation planning Process	Environment, Health and Safety	Water Quality and Management	Coastal Zone Managementand Remote Sensing	Environmental quality Monitoring

Registration of Professional Elective Courses from Verticals:

Professional Elective Courses will be registered in Semesters V and VI. These courses are listed in groups called verticals that represent a particular area of specialization / diversified group. Students are permitted to choose all the Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V and another in semester VI.

The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E./B.Tech (Honours) or Minor degree also. For more details on B.E./B.Tech (Honours) or Minor degree refer to the Regulations 2023 [Clause 12].

PROFESSIONAL ELECTIVE COURSES: VERTICALS**VERTICAL I: STRUCTURES**

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE11	Concrete Structures	PE	3	0	0	3	3	40	60	100
2.	23CEE12	Steel Structures	PE	3	0	0	3	3	40	60	100
3.	23CEE13	Prefabricated Structures	PE	3	0	0	3	3	40	60	100
4.	23CEE14	Prestressed Concrete Structures	PE	3	0	0	3	3	40	60	100
5.	23CEE15	Rehabilitation/Heritage Restoration	PE	3	0	0	3	3	40	60	100
6.	23CEE16	Dynamics and Earthquake Resistant Structures	PE	3	0	0	3	3	40	60	100
7.	23CEE17	Introduction to Finite Element Method	PE	3	0	0	3	3	40	60	100

VERTICAL II: CONSTRUCTION TECHNIQUES AND PRACTICES

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE21	Formwork Engineering	PE	3	0	0	3	3	40	60	100
2.	23CEE22	Construction Equipment and Machinery	PE	3	0	0	3	3	40	60	100
3.	23CEE23	Sustainable Construction and Lean Construction	PE	3	0	0	3	3	40	60	100
4.	23CEE24	Digitalized Construction Lab	PE	0	0	6	6	3	60	40	100
5.	23CEE25	Construction Management and Safety	PE	2	0	2	4	3	50	50	100
6.	23CEE26	Advanced Construction Techniques	PE	3	0	0	3	3	40	60	100
7.	23CEE27	Energy Efficient Buildings	PE	3	0	0	3	3	40	60	100

dy.
Chairman
BoS / Civil

VERTICAL III: GEOTECHNICAL

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE31	Geo-Environmental Engineering	PE	3	0	0	3	3	40	60	100
2.	23CEE32	Ground Improvement Techniques	PE	3	0	0	3	3	40	60	100
3.	23CEE33	Soil Dynamics and Machine Foundations	PE	3	0	0	3	3	40	60	100
4.	23CEE34	Rock Mechanics	PE	3	0	0	3	3	40	60	100
5.	23CEE35	Earth and Earth Retaining Structures	PE	3	0	0	3	3	40	60	100
6.	23CEE36	Pile Foundation	PE	3	0	0	3	3	40	60	100
7.	23CEE37	Tunneling Engineering	PE	3	0	0	3	3	40	60	100

VERTICAL IV: GEO-INFORMATICS

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE41	Total Station and GPS Surveying	PE	3	0	0	3	3	40	60	100
2.	23CEE42	Remote Sensing Concepts	PE	3	0	0	3	3	40	60	100
3.	23CEE43	Satellite Image Processing	PE	3	0	0	3	3	40	60	100
4.	23CEE44	Cartography and GIS	PE	3	0	0	3	3	40	60	100
5.	23CEE45	Photogrammetry	PE	3	0	0	3	3	40	60	100
6.	23CEE46	Airborne and Terrestrial Laser Mapping	PE	3	0	0	3	3	40	60	100
7.	23CEE47	Hydrographic Surveying	PE	3	0	0	3	3	40	60	100

dyf.
Chairman
BoS / Civil

VERTICAL V: TRANSPORTATION INFRASTRUCTURE

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE51	Airports and Harbours	PE	3	0	0	3	3	40	60	100
2.	23CEE52	Traffic Engineering and Management	PE	3	0	0	3	3	40	60	100
3.	23CEE53	Urban Planning and Development	PE	3	0	0	3	3	40	60	100
4.	23CEE54	Smart Cities	PE	3	0	0	3	3	40	60	100
5.	23CEE55	Intelligent Transport Systems	PE	3	0	0	3	3	40	60	100
6.	23CEE56	Pavement Engineering	PE	3	0	0	3	3	40	60	100
7.	23CEE57	Transportation Planning Process	PE	3	0	0	3	3	40	60	100

VERTICAL VI - ENVIRONMENT

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE61	Climate Change Adaptation and Mitigation	PE	3	0	0	3	3	40	60	100
2.	23CEE62	Air and Noise Pollution Control Engineering	PE	3	0	0	3	3	40	60	100
3.	23CEE63	Environmental Impact Assessment	PE	3	0	0	3	3	40	60	100
4.	23CEE64	Industrial Wastewater Management	PE	2	0	2	4	3	50	50	100
5.	23CEE65	Solid and Hazardous Waste Management	PE	3	0	0	3	3	40	60	100
6.	23CEE66	Environmental Policy and Legislations	PE	3	0	0	3	3	40	60	100
7.	23CEE67	Environmental Health and Safety	PE	3	0	0	3	3	40	60	100


Chairman
BoS / Civil

VERTICAL VII: WATER RESOURCES

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE51	Participatory Water Resources Management	PE	3	0	0	3	3	40	60	100
2.	23CEE52	Ground Water Engineering	PE	3	0	0	3	3	40	60	100
3.	23CEE53	Water Resources Systems Engineering	PE	3	0	0	3	3	40	60	100
4.	23CEE54	Watershed Conservation and Management	PE	3	0	0	3	3	40	60	100
5.	23CEE55	Integrated Water Resources Management	PE	3	0	0	3	3	40	60	100
6.	23CEE56	Urban Water Infrastructure	PE	3	0	0	3	3	40	60	100
7.	23CEE57	Water Quality and Management	PE	3	0	0	3	3	40	60	100

VERTICAL VIII - OCEAN ENGINEERING

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE61	Ocean Wave Dynamics	PE	3	0	0	3	3	40	60	100
2.	23CEE62	Marine Geotechnical Engineering	PE	3	0	0	3	3	40	60	100
3.	23CEE63	Coastal Engineering	PE	3	0	0	3	3	40	60	100
4.	23CEE64	Offshore Structures	PE	3	0	0	3	3	40	60	100
5.	23CEE65	Port and Harbour Engineering	PE	3	0	0	3	3	40	60	100
6.	23CEE66	Coastal Hazards and Mitigation	PE	3	0	0	3	3	40	60	100
7.	23CEE67	Coastal Zone Management and Remote Sensing	PE	3	0	0	3	3	40	60	100

Dr.
Chairman
BoS / Ci

VERTICAL IX: DIVERSIFIED CORSES

SL. NO.	COURSE CODE	COURSE TITLE	CATEGORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS	Max.Marks		
				L	T	P			CA	ES	TM
1.	23CEE51	Steel Concrete Composite Structures	PE	3	0	0	3	3	40	60	100
2.	23CEE52	Finance for Engineers	PE	3	0	0	3	3	40	60	100
3.	23CEE53	Earth and Rock fill Dams	PE	3	0	0	3	3	40	60	100
4.	23CEE54	Computational Fluid Dynamics	PE	3	0	0	3	3	40	60	100
5.	23CEE55	Rainwater Harvesting	PE	3	0	0	3	3	40	60	100
6.	23CEE56	Transport and Environment	PE	3	0	0	3	3	40	60	100
7.	23CEE57	Environmental Quality Monitoring	PE	3	0	0	3	3	40	60	100

OPEN ELECTIVES

Sl. No	Course Code	Course Title	Category	Periods /Week			Credits	Max. Marks		
				L	T	P		CA	ES	TM
OFFERED BY DEPARTMENT OF CIVIL ENGINEERING										
1	23CE011	Civil and Infrastructure Engineering	OE	3	0	0	3	40	60	100
2	23CE012	Environmental Pollution and waste management	OE	3	0	0	3	40	60	100
3	23CE013	Environmental Impact Assessment	OE	3	0	0	3	40	60	100
4	23CE014	Building Services	OE	3	0	0	3	40	60	100
5	23CE015	Water, Sanitation and Health	OE	3	0	0	3	40	60	100
OFFERED BY DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING										
1	23CS011	Foundation of AR/VR	OE	2	0	2	3	50	50	100
2	23CS012	Web Designing	OE	2	0	2	3	50	50	100
3	23CS013	Block Chain fundamentals	OE	2	0	2	3	50	50	100
4	23CS014	Knowledge Management	OE	2	0	2	3	50	50	100
5	23CS015	Cloud Computing Essentials	OE	2	0	2	3	50	50	100

Dr.
Chairman
BoS / Civil

Sl. No	Course Code	Course Title	Category	Periods /Week			Credits	Max. Marks		
				L	T	P		CA	ES	TM
OFFERED BY DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING										
1	23EC011	Basics of electronics in automation	OE	3	0	0	3	40	60	100
2	23EC012	Optical engineering	OE	3	0	0	3	40	60	100
3	23EC013	E-waste management	OE	3	0	0	3	40	60	100
4	23EC014	Consumer electronics	OE	3	0	0	3	40	60	100
5	23EC015	Principles of communication engineering	OE	3	0	0	3	40	60	100
OFFERED BY DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING										
1	23EE011	Renewable Energy Sources	OE	3	0	0	3	40	60	100
2	23EE012	Electrical Vehicle	OE	3	0	0	3	40	60	100
3	23EE013	Energy Auditing and Conservation	OE	3	0	0	3	40	60	100
4	23EE014	Domestic and Industrial Electrical Installations	OE	3	0	0	3	40	60	100
5	23EE015	Microcontroller Based System Design	OE	3	0	0	3	40	60	100
OFFERED BY DEPARTMENT OF MECHANICAL ENGINEERING										
1	23ME011	Industrial Instrumentation	OE	3	0	0	3	40	60	100
2	23ME012	Energy Technology	OE	3	0	0	3	40	60	100
3	23ME013	Reverse Engineering	OE	3	0	0	3	40	60	100
4	23ME014	Fire Safety Engineering	OE	3	0	0	3	40	60	100
5	23ME015	Nano Technology	OE	3	0	0	3	40	60	100
OFFERED BY DEPARTMENT ARTIFICIAL INTELLIGENCE AND DATA SCIENCE										
1	23AD011	Introduction to Big Data	OE	2	0	2	3	50	50	100
2	23AD012	Principles of Data Science	OE	2	0	2	3	50	50	100
3	23AD013	Data Visualization and its Applications	OE	2	0	2	3	50	50	100
4	23AD014	Data Warehousing and Mining	OE	2	0	2	3	50	50	100
5	23AD015	Principles of Cyber Security	OE	2	0	2	3	50	50	100

Chairman
BoS / Civil

Sl. No	Course Code	Course Title	Category	Periods /Week			Credits	Max. Marks		
				L	T	P		CA	ES	TM
OFFERED BY DEPARTMENT INFORMATION TECHNOLOGY										
1	23IT011	Basics of Java Programming	OE	2	0	2	3	50	50	100
2	23IT012	Ethical Hacking	OE	2	0	2	3	50	50	100
3	23IT013	E-Commerce and Applications	OE	2	0	2	3	50	50	100
4	23IT014	Basics of Android Application Development	OE	2	0	2	3	50	50	100
5	23IT015	Introduction to Web Design	OE	2	0	2	3	50	50	100
OFFERED BY DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY										
1	23PT011	Nutraceuticals	OE	3	0	0	3	40	60	100
2	23PT012	IPR for Pharma Industry	OE	3	0	0	3	40	60	100
3	23PT013	Pharmaceutical Nanotechnology	OE	3	0	0	3	40	60	100
4	23PT014	Basics of Human Anatomy and physiology	OE	3	0	0	3	40	60	100
OFFERED BY DEPARTMENT BIOMEDICAL ENGINEERING										
1	23BM011	Biomedical Instrumentation	OE	3	0	0	3	40	60	100
2	23BM012	Medical Optics	OE	3	0	0	3	40	60	100
3	23BM013	Biometric systems and their applications	OE	3	0	0	3	40	60	100
4	23BM014	Healthcare Management systems	OE	3	0	0	3	40	60	100
5	23BM015	IOT in Medicine	OE	3	0	0	3	40	60	100

duy.
Chairman
BoS / Civil

23IPA11

INDUCTION PROGRAMME
(Common to B.E./B.Tech. all Branches)

L T P C
- - - 0

This is a mandatory **2 week programme** to be conducted as soon as the students enter the institution. Normal classes start only after the induction program is over.

The induction programme has been introduced by AICTE with the following objective:

"Engineering colleges were established to train graduates well in the branch/department of admission, have a holistic outlook, and have a desire to work for national needs and beyond. The graduating student must have knowledge and skills in the area of his/her study. However, he/she must also have broad understanding of society and relationships. Character needs to be nurtured as an essential quality by which he/she would understand and fulfill his/her responsibility as an engineer, a citizen and a human being. Besides the above, several meta-skills and underlying values are needed."

"One will have to work closely with the newly joined students in making them feel comfortable, allow them to explore their academic interests and activities, reduce competition and make them work for excellence, promote bonding within them, build relations between teachers and students, give a broader view of life, and build character."

Hence, the purpose of this programme is to make the students feel comfortable in their new environment, open them up, set a healthy daily routine, create bonding in the batch as well as between faculty and students, develop awareness, sensitivity and understanding of the self, people around them, society at large, and nature.

The following are the activities under the induction program in which the student would be fully engaged throughout the day for the entire duration of the program.

(i) Physical Activity:

This would involve a daily routine of physical activity with games and sports, yoga, gardening, etc.

(ii) Creative Arts:

Every student would choose one skill related to the arts whether visual arts or performing arts. Examples are painting, sculpture, pottery, music, dance etc. The student would pursue it every day for the duration of the program. These would allow for creative expression. It would develop a sense of aesthetics and also enhance creativity which would, hopefully, grow into engineering design later

(iii) Universal Human Values:

This is the anchoring activity of the Induction Programme. It gets the student to explore oneself and allows one to experience the joy of learning, stand up to peer pressure, take decisions with courage, be aware of relationships with colleagues and supporting stay in the hostel and department, be sensitive to others, etc. A module in Universal Human Values provides the base. Methodology of teaching this content is extremely important. It must not be through do's and don't's, but get students to explore and think by engaging them in a dialogue. It is best taught through group discussions and real life activities rather than lecturing.

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

Discussions would be conducted in small groups of about 20 students with a faculty mentor each. It would be effective that the faculty mentor assigned is also the faculty advisor for the student for the full duration of the UG programme.

(iv) Literary Activity:

Literary activity would encompass reading, writing and possibly, debating, enacting a play etc.

(v) Proficiency Modules:

This would address some lacunas that students might have, for example, English, computer familiarity etc.

(vi) Lectures by Eminent People:

Motivational lectures by eminent people from all walks of life should be arranged to give the students exposure to people who are socially active or in public life.

(vii) Visits to Local Area:

A couple of visits to the landmarks of the city, or a hospital or orphanage could be organized. This would familiarize them with the area as well as expose them to the under privileged.

(viii) Familiarization to Dept./Branch & Innovations:

They should be told about what getting into a branch or department means what role it plays in society, through its technology. They should also be shown the laboratories, workshops & other facilities.

(ix) Department Specific Activities:

About a week can be spent in introducing activities (games, quizzes, social interactions, small experiments, design thinking etc.) that are relevant to the particular branch of Engineering/Technology/Architecture that can serve as a motivation and kindle interest in building things (become a maker) in that particular field. This can be conducted in the form of a workshop.

For example, CSE and IT students may be introduced to activities that kindle computational thinking, and get them to build simple games. ECE students may be introduced to building simple circuits as an extension of their knowledge in Science, and so on. Students may be asked to build stuff using their knowledge of science.

Induction Programme is totally an activity based programme and therefore there shall be no tests / assessments during this programme.

REFERENCES:

1. Guide to Induction program from AICTE

Signature
02/09/2023

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23ENT11

PROFESSIONAL ENGLISH - I
(Common to B.E./B.Tech. all Branches)

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To improve the communicative competence of learners.
- To learn to use basic grammatical structures in suitable contexts.
- To acquire lexical competence and use them appropriately in a sentence and understand their meaning in a text.
- To help learners use language effectively in professional contexts.
- To develop learners' ability to read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.

UNIT-I	INTRODUCTION TO EFFECTIVE COMMUNICATION AND FUNDAMENTALS OF COMMUNICATION	10
---------------	----------------------------------------------------------------------------------	-----------

Introduction to Effective Communication- Barriers of Communication, Seven C's of Effective Communication, Effective Listening, Effective Speaking, Excellence in Reading, Ways to Develop Language and Communication Skills.

Reading- Reading Brochures (Technical Context), Telephone Messages/ Social Media Messages Relevant to Technical Contexts and Emails.

Writing- Writing Emails / Letters Introducing Oneself.

Grammar- Present Tense (Simple and Progressive); Question Types: Wh/ Yes or No/ and Tags.

Vocabulary- Synonyms; One Word Substitution; Abbreviations & Acronyms (as Used in Technical Contexts)

UNIT-II	NARRATION AND SUMMATION	9
----------------	--------------------------------	----------

Reading - Reading Biographies, Travelogues, Newspaper Reports, Excerpts from Literature, and Travel & Technical Blogs.

Writing - Guided writing, Paragraph Writing, Short Report on an Event (Field Trip etc.)

Grammar - Past Tense (Simple); Subject-Verb Agreement; and Prepositions.

Vocabulary - Word Forms (Pre fixes& Suf ixes); Synonyms and Antonyms; Phrasal Verbs.

UNIT-III	DESCRIPTION OF A PROCESS / PRODUCT	9
-----------------	-------------------------------------------	----------

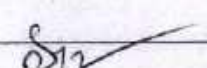
Reading - Reading Advertisements, Gadget Reviews; User Manuals.

Writing - Writing Definitions; Instructions; and Product /Process Description.

Grammar - Imperatives; Adjectives; Degrees of Comparison; Present & Past Perfect Tenses.

Vocabulary- Compound Nouns, Homonyms; and Homophones, Discourse Markers (Connectives & Sequence Words)

SVHEC -R2023


Chairman
BoS / S&H

UNIT-IV

CLASSIFICATION AND RECOMMENDATIONS

9

Reading - Newspaper Articles; Journal Reports -and Non Verbal Communication (Tables, Pie Charts etc...)

Writing - Note-making / Note-taking (*Study skills to be taught, not tested); Writing Recommendations; Transferring Information from Non Verbal (Chart , Graph etc, to Verbal Mode)

Grammar - Articles; Pronouns - Possessive & Relative Pronouns.

Vocabulary - Collocations; Fixed / Semi Fixed Expressions

UNIT-V

EXPRESSION

8

Reading - Reading Editorials; and Opinion Blogs;

Writing - Essay Writing (Descriptive or Narrative).

Grammar- Future Tenses, Punctuation; Negation (Statements & Questions); and Simple, Compound & Complex Sentences.

Vocabulary - Cause & Effect Expressions – Content vs. Function Words.

TOTAL : 45 PERIODS

COURSE OUTCOMES:

At the end of the Course the students will able to

- CO1:** Use appropriate words in a professional context
- CO2:** Gain understanding of basic grammatical structures and use them in right context
- CO3:** Read and infer the denotative and connotative meanings of technical text
- CO4:** Read and interpret information presented in tables, charts and other graphic forms
- CO5:** Write definitions, descriptions, narrations and essays on various topics

TEXT BOOKS:

1. Department of English, Anna University, "English for Engineers & Technologists" Orient Blackswan Private Ltd, 2020.
2. Dr.Veena Selvam, Dr.Sujatha Priyadarshini, & CO, Department of English, Anna University, "English for Science & Technology" Cambridge University Press, 2021.

REFERENCE BOOKS:

1. Meenakshi Raman & Sangeeta Sharma, "Technical Communication-Principles and Practices", Oxford Univ. Press, New Delhi, 2016.

SVHEC •R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

- 2 Lakshminarayanan, "A Course Book on Technical English", Scitech Publications (India) Pvt.Ltd. 2012.
- 3 Aysha Viswamohan, "English For Technical Communication (With CD)", McGraw Hill Education, ISBN : 0070264244, 2008.
- 4 Effective Communication Skill, Kulbhusan Kumar, R S Salaria, Khanna Publishing House, 2016.

E. RESOURCES:

- <https://learnenglish.britishcouncil.org/>

CO's-PO's MAPPING :

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	-	-	-	-	-	-	-	-	2	3	-	3
C02	-	-	-	-	-	1	-	-	2	3	-	2
C03	-	-	-	-	-	1	-	-	3	3	-	3
C04	-	-	-	2	-	-	-	-	3	3	-	3
C05	-	-	-	-	-	-	-	-	2	3	-	2
AVR	-	-	-	2	-	1	-	-	2	3	-	3

1- Low, 2- Medium, 3-High, "-" No Correlation

23MAT11

MATRICES AND CALCULUS
(Common to B.E./B.Tech. all Branches)

L T P C
3 1 0 4

COURSE OBJECTIVES:

- To develop the use of matrix algebra techniques that is needed by engineers for practical applications
- To familiarize the students with differential calculus
- To familiarize the student with functions of several variables. This is needed in many branches of engineering
- To make the students understand various techniques of integration
- To acquaint the student with mathematical tools needed in evaluating multiple integrals and their applications

UNIT-I

MATRICES

9+3

Eigenvalues and Eigenvectors of a real matrix - Characteristic equation - Properties of Eigenvalues and Eigenvectors - Cayley - Hamilton theorem - Diagonalization of matrices by orthogonal transformation - Reduction of a quadratic form to canonical form by orthogonal transformation - Nature of quadratic forms - Applications : Stretching of an elastic membrane.

UNIT-II

DIFFERENTIAL CALCULUS

9+3

Representation of functions - Limit of a function - Continuity - Derivatives - Differentiation rules (sum, product, quotient, chain rules) - Implicit differentiation - Applications : Maxima and Minima of functions of one variable.

UNIT-III

FUNCTIONS OF SEVERAL VARIABLES

9+3

Partial differentiation - Homogeneous functions and Euler's theorem - Total derivative - Change of variables - Jacobians - Partial differentiation of implicit functions - Taylor's series for functions of two variables - Applications : Maxima and minima of functions of two variables and Lagrange's method of undetermined multipliers.


UNIT-IV

INTEGRAL CALCULUS

9+3

Definite and Indefinite Integrals - Substitution rule - Techniques of Integration : Integration by parts, Trigonometric integrals, Trigonometric substitutions, Integration of rational functions by partial fraction, Improper integrals - Applications : Hydrostatic force and pressure, moments and centre of mass.

SVHEC-R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

UNIT-V

MULTIPLE INTEGRALS

9+3

Double integrals – Change of order of integration – Double integrals in polar coordinates – Area enclosed by plane curves – Triple integrals – Volume of solids – Change of variables in double and triple integrals – Applications: Moments and centre of mass, moment of inertia.

TOTAL : 60 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to :

- CO1:** Use the matrix algebra methods for solving practical problems
- CO2:** Apply differential calculus tools in solving various application problems.
- CO3:** Use differential calculus ideas on several variable functions
- CO4:** Apply different methods of integration in solving practical problems
- CO5:** Apply multiple integral ideas in solving areas, volumes and other practical problems

TEXT BOOKS :

1. James Stewart, "Calculus : Early Transcendentals", Cengage Learning, 8th Edition, New Delhi, 2019. [For Units II & IV - Sections 1.1, 2.2, 2.3, 2.5, 2.7 (Tangents problems only), 2.8, 3.1 to 3.6, 3.11, 4.1, 4.3, 5.1 (Area problems only), 5.2, 5.3, 5.4 (excluding net change theorem), 5.5, 7.1 - 7.4 and 7.8]
2. Grewal. B. S., "Higher Engineering Mathematics", Khanna Publishers, New Delhi, 44th Edition, 2018

REFERENCE BOOKS :

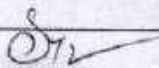
1. Thomas. G. B., Hass. J, and Weir. M.D, "Thomas Calculus", 14th Edition, Pearson India, 2022
2. Anton. H, Bivens. I and Davis. S, " Calculus ", Wiley, 10th Edition, 2021
3. Jain. R.K. and Iyengar. S.R.K., "Advanced Engineering Mathematics", Narosa Publications, New Delhi, 5th Edition, 2016
4. Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd, New Delhi, 2016

CO's - PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	-	-	-	-	2	-	2	3
CO2	3	3	1	1	-	-	-	-	3	-	2	3
CO3	3	3	1	1	-	-	-	-	2	-	2	3
CO4	3	3	1	1	-	-	-	-	2	-	2	3
CO5	3	2	1	1	-	-	-	-	2	-	2	3
AVG	3	3	1	1	-	-	-	-	2	-	2	3

1- Low, 2- Medium , 3-High, "-" No Correlation

SVHEC-R2023


Chairman
BoS / S&H

23PHT11

ENGINEERING PHYSICS
(Common to B.E./B. Tech. all branches)

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To make the students effectively achieve an understanding of mechanics
- Provide knowledge of elastic property, thermal property of materials and its applications
- Impart knowledge of laser and their applications
- Introduce the essential principles of fiber optics and its applications
- Equipping the students to successfully understand the importance of quantum physics

UNIT-I

MECHANICS

10

Multi-particle dynamics: Center of mass (CM) – CM of continuous bodies – motion of the CM – kinetic energy of the system of particles. Rotation of rigid bodies: Rotational kinematics – rotational kinetic energy and moment of inertia – theorems of M – M.I of a diatomic molecule – torque – rotational dynamics of rigid bodies – rotational energy state of a rigid diatomic molecule – torsional pendulum – double pendulum

UNIT-II

PROPERTIES OF MATTER AND THERMAL PHYSICS

10

Elasticity- Hooke's law – stress – strain diagram – Poisson's ratio – Factors affecting elasticity – bending of beams- Bending moment equation – Depression of a cantilever-Young's modulus by uniform bending – I-shaped girders- Modes of heat transfer – thermal conductivity – Newton's law of cooling – Linear heat flow – Lee's disc method – conduction through compound media (series and parallel)

UNIT-III

LASER

9

Lasers: Stimulated absorption – Spontaneous emission – Stimulated emission – Population inversion-Einstein's coefficients derivation and their relations – Pumping methods – Types of lasers – Nd:YAG, CO₂ laser, Semiconductor lasers (homojunction & heterojunction) – Industrial and Medical Applications of lasers

UNIT-IV

FIBER OPTICS

8

Principle and propagation of light in optical fibres – Numerical aperture and Acceptance angle – Types of optical fibres (material, refractive index, mode) – attenuation, dispersion, bending – Fiber optics communication system (qualitative) – Temperature and displacement sensors – fiber optic endoscope

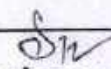
UNIT-V

QUANTUM PHYSICS

8

Photons and light waves – Electrons and matter waves – Compton effect: theory of scattering – Derivation and experimental verification – The Schrodinger equation (Time dependent and

SYHEC-R2023


Chairman
BoS/G&H

time independent forms) – particle in a one-dimensional rigid box for eigen value and eigen function – tunneling (qualitative) – scanning tunneling microscope

TOTAL: 45 PERIODS

COURSE OUTCOME:

At the end of the course the students will be able to

- CO1:** Understand the importance of mechanics.
- CO2:** Describe the Elastic property of solid materials and thermal conductivity of solids in industrial applications
- CO3:** Demonstrate a foundational knowledge in lasers
- CO4:** The students will get knowledge on fiber optics
- CO5:** Understand the importance of quantum physics

TEXT BOOKS:

1. D.Kleppner and R.Kolenkow, "An Introduction to Mechanics," McGraw Hill Education (Indian Edition), 2017
2. Arthur Beiser, Shobhit Mahajan, S.Rai Choudhury, "Concepts of Modern Physics," McGraw-Hill (Indian Edition), 2017

REFERENCE BOOKS:

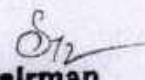
1. K.Thyagarajan and A.Ghatak, "Lasers: Fundamentals and Applications," Laxmi Publications, (Indian Edition), 2023
2. D.Halliday, R.Resnick and J.Walker, "Principles of Physics," Wiley (Indian Edition), 2021
3. N.Garcia, A.Damask and S.Schwarz, "Physics for Computer Science Students," Springer-Verlag, 2012

CO's- PO's MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	2	1	1	-	-	-	-	-	-	-
CO2	3	3	2	1	1	-	-	-	-	-	-	-
CO3	3	2	2	1	2	-	-	-	-	-	-	1
CO4	3	2	2	1	2	-	-	-	-	-	-	1
CO5	3	3	1	1	2	-	-	-	-	-	-	-
AVG	3	3	2	1	2	-	-	-	-	-	-	1

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC-R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23CYT11

ENGINEERING CHEMISTRY
(Common to B.E./B. Tech. all branches)

L T P C
3 0 0 3

COURSE OBJECTIVES:

- To inculcate sound understanding of water quality parameters and water treatment techniques
- To impart knowledge on the basic principles and preparatory methods of nanomaterials
- To introduce the basic concepts and applications of phase rule and composites
- To facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics
- To familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices

UNIT-I

WATER AND ITS TREATMENT

9

Water: Sources and impurities, **Water quality parameters:** turbidity, pH, hardness, alkalinity, TDS, COD and BOD. **Desalination of brackish water:** Reverse Osmosis. **Boiler troubles:** Scale and sludge, Boiler corrosion, Caustic embrittlement, Priming & foaming. **Treatment of boiler feed water:** Internal treatment (phosphate, colloidal, sodium aluminate and calgon conditioning) and External treatment - Ion exchange demineralisation and zeolite process. **Municipal water treatment:** primary treatment and disinfection (UV, Ozonation, break-point chlorination)

UNIT-II

NANOCHEMISTRY

9

Basics: Distinction between molecules, nanomaterials and bulk materials; **Size-dependent properties** (optical, electrical, mechanical and magnetic); **Types of nanomaterials:** Definition, properties and uses of - nanoparticle, nanowire and nanotube. **Preparation of nanomaterials:** sol-gel, solvothermal, laser ablation, electrochemical deposition. **Applications** of nanomaterials with examples in medicine, agriculture, energy, electronics and catalysis.

UNIT-III

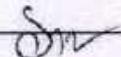
PHASE RULE AND COMPOSITES

9

Phase rule: Introduction, definition of terms with examples. One component system - water system; Reduced phase rule; Construction of a simple eutectic phase diagram - Thermal analysis; Two component system: lead-silver system - Pattinson's process.

Composites: Introduction: Definition & Need for composites; **Constitution:** Matrix materials (Polymer matrix, metal matrix and ceramic matrix) and Reinforcement (fiber, particulates, flakes and whiskers). **Properties and applications of:** Metal matrix composites (MMC), Ceramic matrix composites and Polymer matrix composites.

SVHEC- R2023


Chairman
BoS / S&H

UNIT-IV

FUELS AND COMBUSTION

9

Fuels: Introduction: Classification of fuels; **Coal and coke:** Analysis of coal (proximate and ultimate), Carbonization, Manufacture of metallurgical coke (Otto Hoffmann method). **Petroleum and Diesel:** Manufacture of synthetic petrol (Bergius process), Knocking - octane number, diesel oil - cetane number; **Solid biofuels, Compressed biogas, Power alcohol and biodiesel.**

Combustion of fuels: Introduction: Calorific value - higher and lower calorific values, Theoretical calculation of calorific value; **Flue gas analysis - ORSAT Method. CO₂ emission and carbon foot print.**

UNIT-V

ENERGY SOURCES AND STORAGE DEVICES

9

Nuclear energy: light water nuclear power plant, breeder reactor. **Solar energy conversion:** Principle, working and applications of solar cells; **Recent developments in solar cell materials. Wind energy; Geothermal energy; Batteries:** Types of batteries, Primary battery - dry cell, Secondary battery - lead acid battery and lithium-ion-battery; **Electric vehicles-working principles; Fuel cells:** H₂-O₂ fuel cell, microbial fuel cell; **Supercapacitors:** Storage principle, types and examples

TOTAL : 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able

- CO1:** To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
- CO2:** To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
- CO3:** To apply the knowledge of phase rule and composites for material selection requirements.
- CO4:** To recommend suitable fuels for engineering processes and applications.
- CO5:** To recognize different forms of energy resources and apply them for suitable applications in energy sectors

TEXT BOOKS:

1. P. C. Jain and Monica Jain, "Engineering Chemistry", 17th Edition, DhanpatRai Publishing Company (P) Ltd, New Delhi, 2018
2. S.S. Dara, "A text book of Engineering Chemistry", S. Chand Publishing, 12th Edition, 2018

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

REFERENCE BOOKS:

1. Shashi Chawla, "A Text Book of Engineering Chemistry", Dhanpar Rai & Co (Pvt.) Ltd, New Delhi, 2011
2. O.G. Palanna, "Engineering Chemistry", McGraw Hill Education (India) Private Limited, 2nd Edition, 2017
3. Dr. A.Ravikrishnan, "Engineering Chemistry", Sri Krishna Hitech Publishing Company Pvt. Limited, 23rd Edition, 2023

CO's- PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	3	1	1	3	3	-	-	-	-	-
CO2	3	2	1	1	2	2	-	-	-	-	-	1
CO3	3	3	1	1	1	1	-	-	-	-	-	-
CO4	3	2	1	1	1	1	-	-	-	-	-	-
CO5	3	2	2	1	2	2	2	-	-	-	-	-
AVG	3	2	2	1	1	2	3	-	-	-	-	1

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC- R2023


Chairman
BoS / S&H

23CST11

PROBLEM SOLVING AND PYTHON PROGRAMMING

(Common to: B.E. / B.Tech. all Branches)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To solve problems using computational thinking methods using pseudo code and flowchart
- To understand the fundamentals of algorithmic problem solving basics and strategies
- To define variables data types and error messages
- To learn to solve problems using Python conditionals loops lists tuples and dictionaries to represent complex data
- To understand the functions modules and do input/output with files in Python

UNIT-I

COMPUTATIONAL THINKING

8

Introduction - Problem solving and Decomposition - Abstraction - Notations Pseudo code - Flow chart - Programming language

UNIT-II

ALGORITHMIC PROBLEM SOLVING

8

Algorithm Implementation - Top down design - Simple strategies for developing algorithms - Iteration - Recursion - Fundamental algorithms - Anticipating and Dealing with Errors

UNIT-III

BASICS BUILDING BLOCKS OF PYTHON

9

Variables - Immutable variables - Data types - Operators - Python Reserved Words - Understanding error messages

UNIT-IV

CONTROL STATEMENTS AND STRUCTURED TYPES

10

Control Flow - Indenting - if Statement - while Loop - break and continue - for Loop - String - Lists - Tuples - Sets - Dictionaries

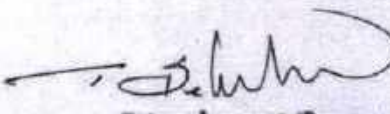
UNIT-V

FUNCTIONS, MODULES AND FILES

10

Definition - Hiding redundancy - Arguments and return values - Variable Number of Arguments - Scope - Passing Functions to a Function - Mapping Functions in a Dictionary - Lambda function - Recursive Functions - Modules: Standard Modules - OS and SYS modules - User defined Modules - Importing modules - Writing into a File - Reading from a File - File Methods

TOTAL : 45 PERIODS


Chairman
BOS/CSE&IT

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1:** Develop algorithmic solutions for simple computational problems to develop and execute simple Python programs.
- CO2:** Write the Algorithms for problem solving basics and strategies to solve complex problems
- CO3:** Compose simple Python programs using to illustrate variables data types and error messages.
- CO4:** Represent compound data using Python conditionals loops lists tuples dictionaries for solving problems
- CO5:** Create functions modules read and write data from/to files in Python programs.

TEXT BOOKS:

1. R. G. Dromey "How to Solve it by Computer", Pearson Education., 2015
2. Charles Dierbach "Introduction to Computer Science using Python: A Computational Problem- Solving Focus", Wiley India., 2015

REFERENCE BOOKS:

1. John V. Guttag "Introduction to Computation and Programming using Python", The MIT press. 2021 (3rd Edition).
2. Paul Gries, Jennifer Campbell, Jason Montojo "Practical Programming: An Introduction to Computer Science using Python 3", Pragmatic Programmers., 2013 , Second edition
3. Robert Sedgewick, Kevin Wayne, Robert Dondero "Introduction to Programming in Python: An Inter-disciplinary Approach", Pearson India., 2016
4. Karl Beecher "Computational Thinking - A beginner's guide to problem solving and Programming", BCS Learning &Development., 2017

E-RESOURCES:

1. <http://www.flowgorithm.org/>
2. <https://www.python.org/>
3. <https://nptel.ac.in/courses/106104074>

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3
CO2	2	3	3	3	2	-	-	-	-	-	2	-	3	3	3
CO3	2	2	-	2	2	-	-	-	-	-	1	-	3	3	3
CO4	1	2	-	-	1	-	-	-	-	-	1	-	2	3	3
CO5	2	2	-	-	2	-	-	-	-	-	1	2	2	3	3
AVG	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23TAT11

HERITAGE OF TAMILS
(Common to B.E./B. Tech. all branches)

L T P C
1 0 0 1

COURSE OBJECTIVES:

- To understand the Sangam and modern literature of Tamil
- To learn the heritage of Tamil culture
- To recognize the various art forms of Tamils
- To explain the Thinai concept of Tamils
- To realize the contribution of Tamils to Indian national movement and Indian culture

UNIT-I **LANGUAGE AND LITERATURE** **3**

Language Families in India - Dravidian Languages - Tamil as a Classical Language - Classical Literature in Tamil - Secular Nature of Sangam Literature - Distributive Justice in Sangam Literature- Management Principles in Thirukural - Tamil Epics and Impact of Buddhism & Jainism in Tamil Land- Bakthi Literature Azhwars and Nayanmars - Forms of minor Poetry - Development of Modern literature in Tamil - Contribution of Bharathiyar and Bharathidhasan.

UNIT-II **HERITAGE - ROCK ART PAINTINGS** **3**
TO MODERN ART - SCULPTURE

Hero stone to modern sculpture - Bronze icons - Tribes and their handicrafts - Art of temple car making - Massive Terracotta sculptures, Village deities, Thiruvalluvar Statue at Kanyakumari, Making of musical instruments - Mridhangam, Parai, Veenai, Yash and Nadhaswaram - Role of Temples in Social and Economic Life of Tamils.

UNIT-III **FOLK AND MARTIAL ARTS** **3**

Therukoothu, Karagattam, Villu Pattu, Kaniyan Koothu, Oyillattam, Leather puppetry, Silambattam, Valari, Tiger dance - Sports and Games of Tamils.

UNIT-IV **THINAI CONCEPTS OF TAMILS** **3**

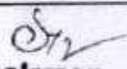
Flora and Fauna of Tamils & Aham and Puram Concept from Tholkappiyam and Sangam Literature - Aram Concept of Tamils - Education and Literacy during Sangam Age - Ancient Cities and Ports of Sangam Age - Export and Import during Sangam Age - Overseas Conquest of Cholas.

UNIT-V **CONTRIBUTION OF TAMILS TO INDIAN** **3**
NATIONAL MOVEMENT AND INDIAN CULTURE

Contribution of Tamils to Indian Freedom Struggle - The Cultural Influence of Tamils over the other parts of India - Self-Respect Movement - Role of Siddha Medicine in Indigenous Systems of Medicine - Inscriptions & Manuscripts - Print History of Tamil Books.

TOTAL: 15 PERIODS

SVHEG-R023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

COURSE OUTCOMES:

At the end of the course the student will be able to

- CO1:** Gain knowledge about various literatures of Tamil
- CO2:** Learn the uniqueness of Tamil cultural heritage
- CO3:** Find various art forms of Tamil Nadu
- CO4:** Understand the Thinaï concepts in Tamil
- CO5:** Distinguish the contribution of Tamils to Indian national movement and Indian culture

E- RESOURCES:

1. <https://www.tamilvu.org/>

CO's -PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	-	-	-	-	-	1	1	1	-	1	-	-
C02	-	-	-	-	-	1	1	1	-	1	-	-
C03	-	-	-	-	-	1	1	1	-	1	-	-
C04	-	-	-	-	-	1	1	1	-	1	-	-
C05	-	-	-	-	-	1	1	1	-	1	-	-
AVG	-	-	-	-	-	1	1	1	-	1	-	-

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC-R2023


Chairman
BoS / S&H

23TAT11

தமிழர் மரபு

L T P C
1 0 0 1

(B.E./B.Tech- அனைத்து பாடப்பிரிவுகளுக்கும் பொதுவானது)

பாடநெறி நோக்கங்கள்:

- > தமிழின் இலக்கியங்கள் மற்றும் நவீன இலக்கியங்களைப் புரிந்துகொள்ளுதல்
- > தமிழ் கலாச்சார பாரம்பரியத்தைக் கற்றுக்கொள்ளுதல்
- > தமிழர்களின் பல்வேறு கலைவடிவங்களைக் கண்டறிதல்
- > தமிழர்களின் திணைக்கோட்பாடுகளை விளக்குதல்
- > இந்திய சுதந்திர போராட்ட இயக்கங்களுக்கும் இந்திய கலாச்சாரத்திற்குமான தமிழர்களின் பங்களிப்பை உணர்தல்

அலகு - I

மொழி மற்றும் இலக்கியம்

3

இந்திய மொழிக் குடும்பங்கள் - திராவிட மொழிகள் - தமிழ் ஒரு செம்மொழி - தமிழ் செவ்விலக்கியங்கள் - சங்க இலக்கியத்தின் சமய சார்பற்ற தன்மை - சங்க இலக்கியத்தில் பகிர்தல் ஆறம் - திருக்குறளில் மேலாண்மைக் கருத்துக்கள் - தமிழ்க் காப்பியங்கள், தமிழகத்தில் சமணப் பெளத்த மதங்களின் தாக்கம் - பக்தி இலக்கியம், ஆழ்வார்கள் மற்றும் நாயன்மார்கள் - சிற்றிலக்கியங்கள் - தமிழில் நவீன இலக்கியத்தின் வளர்ச்சி - தமிழ் இலக்கிய வளர்ச்சியில் பாரதியார் மற்றும் பாரதிதாசன் ஆகியோரின் பங்களிப்பு.

அலகு - II

மரபு - பாறை ஓவியங்கள் முதல் நவீன ஓவியங்கள் வரை - சிற்பக் கலை

3

நடுகல் முதல் நவீன சிற்பங்கள் வரை - ஐம்பொன் சிலைகள் - பழங்குடியினர் மற்றும் அவர்கள் தயாரிக்கும் கைவினைப்பொருட்கள், பொம்மைகள் - தேர் செய்யும் கலை - சுடுமண் சிற்பங்கள் - நாட்டுப்புறத் தெய்வங்கள் - குமரிமுனையில் திருவள்ளுவர் சிலை - இசைக்கருவிகள் - மிருதங்கம், பறை வீணை, யாழ், நாதஸ்வரம் - தமிழர்களின் சமூக பொருளாதார வாழ்வில் கோவில்களின் பங்கு.

அலகு - III

நாட்டப்புறக் கலைகள் மற்றும் வீரவிளையாட்டுகள்

3

தெருக்கூத்து, கரகாட்டம், வில்லுப்பாட்டு, கணியான் கூத்து, ஓயிலாட்டம், தோல்பாவைக் கூத்து, சிலம்பாட்டம், வளரி, புலியாட்டம், தமிழர்களின் விளையாட்டுகள்.

அலகு - IV

தமிழர்களின் திணைக் கோட்பாடுகள்

3

தமிழகத்தின் தாவரங்களும், விலங்குகளும் - தொல்காப்பியம் மற்றும் சங்க இலக்கியத்தில் அகம் மற்றும் புறக் கோட்பாடுகள் - தமிழர்கள் போற்றிய அறக்கோட்பாடு - சங்ககாலத்தில் தமிழகத்தில் எழுத்தறிவு, கல்வியும் - சங்ககால நகரங்களும் துறைமுகங்களும் - சங்ககாலத்தில் ஏற்றுமதி மற்றும் இறக்குமதி - கடல்கடந்த நாடுகளில் சோழர்களின் வெற்றி

SVHEC-R2023

Chairman
BoS / S&M

அலகு - V

இந்திய தேசிய இயக்கம் மற்றும்

3

இந்திய பண்பாட்டிற்குத் தமிழர்களின் பங்களிப்பு

இந்திய விடுதலைப்போரில் தமிழர்களின் பங்கு - இந்தியாவின் பிற்பகுதிகளில் தமிழ்ப் பண்பாட்டின் தாக்கம் - சுயமரியாதை இயக்கம் - இந்திய மருத்துவத்தில், சித்த மருத்துவத்தின் பங்கு - கல்வெட்டுகள், கையெழுத்துப்படிகள் - தமிழ்ப் புத்தகங்களின் அச்சு வரலாறு.

மொத்தம்: 15 பாடவேளைகள்

பாடநெறி முடிவுகள்:

இப்பாடத்தைப் படிப்பதின் முடிவில் மாணவர்கள்

- C01: தமிழின் பல்வேறு இலக்கியங்களைப் பற்றிய அறிவைப் பெறுவார்கள்
- C02: தமிழ் கலாச்சார பாரம்பரியத்தின் தனித்தன்மையைக் கற்றுக்கொள்வார்கள்
- C03: தமிழகத்தின் பல்வேறு கலைவடிவங்களைக் கண்டறிவார்கள்
- C04: தமிழர்களின் திணைக்கோட்பாடுகளை அறிந்துகொள்வார்கள்
- C05: தமிழ் சுதந்திரப்போராட்ட வீரர்கள் மற்றும் தமிழ் கலாச்சாரத்தை இந்தியாவின் மற்ற பகுதியுடன் ஒப்பிடும் திறனைப் பெறுவார்கள்

மின் -ஆதாரங்கள்:

1. <https://www.tamilvu.org/>

CO's -PO's விவரணையாக்கம்:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	-	-	-	-	-	1	1	1	-	1	-	-
C02	-	-	-	-	-	1	1	1	-	1	-	-
C03	-	-	-	-	-	1	1	1	-	1	-	-
C04	-	-	-	-	-	1	1	1	-	1	-	-
C05	-	-	-	-	-	1	1	1	-	1	-	-
AVG	-	-	-	-	-	1	1	1	-	1	-	-

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC-R2023

சென்னை
18.03.2023


Chairman
BoS / S&H

PROBLEM SOLVING AND PYTHON PROGRAMMING**L T P C****23CSL11****LABORATORY****0 0 4 2**

(Common to: B.E. / B.Tech. all Branches)

COURSE OBJECTIVES:

- To understand the problem solving approaches.
- To learn the basic programming constructs in Python.
- To practice various computing strategies for Python-based solutions to real world problems.
- To use Python data structures - lists, tuples, dictionaries.
- To do input/output with files in Python.

LIST OF EXPERIMENTS

Note: The examples suggested in each experiment are only indicative. The lab instructor is expected to design other problems on similar lines. The Examination shall not be restricted to the sample experiments listed here.

1. Identification and solving of simple real life or scientific or technical problems, and developing flow charts for the same. (Electricity Billing, Retail shop billing, Sin series, weight of a motorbike, Weight of a steel bar, compute Electrical Current in Three Phase AC Circuit, etc.)
2. Python programming using simple statements and expressions (exchange the values of two variables, circulate the values of n variables, distance between two points).
3. Scientific problems using Conditionals and Iterative loops. (Number series, Number Patterns, pyramid pattern)
4. Implementing real-time/technical applications using Lists, Tuples. (Items present in a library/Components of a car/ Materials required for construction of a building -operations of list & tuples)
5. Implementing real-time/technical applications using Sets, Dictionaries. (Language, components of an automobile, Elements of a civil structure, etc.- operations of Sets & Dictionaries)
6. Implementing programs using Functions. (Factorial, largest number in a list, area of shape)
7. Implementing programs using Strings. (reverse, palindrome, character count, replacing characters)
8. Implementing programs using written modules and Python Standard Libraries (pandas, numpy, Matplotlib, scipy)
9. Implementing real-time/technical applications using File handling. (copy from one file to another, word count, longest word)
10. Implementing real-time/technical applications using Exception handling. (divide by zero error, voter's age validity, student mark range validation)
11. Exploring Pygame tool.
12. Developing a game activity using Pygame like bouncing ball, car race etc.

TOTAL : 60 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1 :** Develop algorithmic solutions to simple computational problems
- CO2 :** Develop and execute simple Python programs.
- CO3 :** Implement programs in Python using conditionals and loops for solving problems.
- CO4 :** Deploy functions to decompose a Python program.
- CO5 :** Process compound data using Python data structures and Utilize Python packages in developing software applications.

TEXT BOOKS:

1. Allen B. Downey, "Think Python: How to Think like a Computer Scientist", 2nd Edition, O'Reilly Publishers, 2016.
2. Karl Beecher, "Computational Thinking: A Beginner's Guide to Problem Solving and Programming", 1st Edition, BCS Learning & Development Limited, 2017.

REFERENCE BOOKS:

1. Paul Deitel and Harvey Deitel, "Python for Programmers", Pearson Education, 1st Edition, 2021.
2. G Venkatesh and Madhavan Mukund, "Computational Thinking: A Primer for Programmers and Data Scientists", 1st Edition, Notion Press, 2021.
3. John V Guttag, "Introduction to Computation and Programming Using Python: With Applications to Computational Modeling and Understanding Data", Third Edition, MIT Press, 2021.
4. Eric Matthes, "Python Crash Course, A Hands - on Project Based Introduction to Programming", 2nd Edition, No Starch Press, 2019.
5. Martin C. Brown, "Python: The Complete Reference", 4th Edition, Mc-Graw Hill, 2018.

E-RESOURCES:

1. <http://www.flowgorithm.org/>
2. <https://www.python.org/>
3. <https://nptel.ac.in/courses/106104074>

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	-	-	-	-	-	2	2	3	3	3
CO2	3	3	3	3	2	-	-	-	-	-	2	-	3	3	
CO3	2	2	-	2	2	-	-	-	-	-	1	-	3	3	3
CO4	1	2	-	-	1	-	-	-	-	-	1	-	2	3	3
CO5	2	2	-	-	2	-	-	-	-	-	1	-	2	3	3
AVG	2	3	3	3	2	-	-	-	-	-	2	2	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

23PCL11

PHYSICS AND CHEMISTRY LABORATORY
(Common to B.E./B. Tech. all branches)

L	T	P	C
0	0	4	2

PHYSICS LABORATORY
(Any Seven Experiments)

COURSE OBJECTIVES:

- Determination of the physical parameters such as young's modulus by Uniform bending method, Non-Uniform bending method, Simple harmonic oscillations of cantilever and rigidity modulus of wire
- To impart knowledge in the determination of the thermal conductivity of a bad conductor by Lee's Disc method and band gap of a semiconductor
- Determination of the wavelength of the laser using grating, numerical aperture and acceptance angle in an optical fiber and width of the groove in a compact disc by using laser
- Determination of the velocity of sound and compressibility of liquids by using ultrasonic interferometer
- Knowledge on the frequency of alternating current using electrically vibrating tuning fork by using Melde's apparatus

LIST OF EXPERIMENTS

1. Determination of Young's modulus by Uniform bending method
2. Determination of Young's modulus by non-uniform bending method
3. Simple harmonic oscillations of cantilever
4. Determination of rigidity modulus of wire and moment of inertia of regular objects - Torsion pendulum
5. Determination of thermal conductivity of a bad conductor - Lee's Disc method
6. Determination of band gap of a semiconductor
7. Determination of the wavelength of the laser using grating
8. a) Determination of numerical aperture and acceptance angle in an optical fiber
b) Determination of width of the groove in a compact disc by using laser
9. Determination of the velocity of sound and compressibility of liquids by using ultrasonic interferometer
10. Determination of the frequency of alternating current using electrically vibrating tuning fork - Melde's apparatus

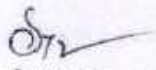
TOTAL: 30 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- C01:** Experiment and determine the physical characteristics of given solid materials using Young's modulus-Uniform bending method, non-uniform bending method, cantilever method and Torsion Pendulum.
- C02:** Experiment and determine the thermal conductivity of a bad conductor using Lee's Disc method and band gap energy of a given semiconducting material using Zener diode.
- C03:** Experiment and determine the optical property of light sources, acceptance angle of optical fiber and width of the groove in a compact disc using Laser.
- C04:** Experiment and determine the velocity of ultrasonic waves using ultrasonic interferometer.
- C05:** Experiment and determine the frequency of alternating current using electrically vibrating tuning fork by using Melde's apparatus

SVHEC-R2023


Chairman
BoS / G&H

TEXT BOOKS:

1. Dr. P. Mani, Engineering Physics Practicals, Dhanam Publications (2022)

CO's - PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	-	-	-	-	-	-	-	-
CO2	3	3	1	1	-	-	-	-	-	-	-	-
CO3	3	3	1	1	-	-	-	-	-	-	-	-
CO4	3	3	1	1	-	-	-	-	-	-	-	-
CO5	3	3	1	1	-	-	-	-	-	-	-	-
AVG	3	3	1	1	-	-	-	-	-	-	-	-

CHEMISTRY LABORATORY
(Any Seven Experiments)

COURSE OBJECTIVES:

- To inculcate experimental skills to test basic understanding of water quality parameters, such as acidity, alkalinity.
- To acquire the knowledge in total hardness and dissolved oxygen and its impacts in industries through experiments
- To understand the impacts of chlorine in water sample through volumetric analysis.
- To induce the students to familiarize with electroanalytical techniques in the determination of impurities in aqueous solutions.
- To determine the amount of metal ions through spectroscopic techniques.

LIST OF EXPERIMENTS

1. Preparation of Na_2CO_3 as a primary standard and estimation of acidity of a water sample using the primary standard.
2. Determination of types and amount of alkalinity in a water sample
3. Determination of total, temporary & permanent hardness of water by EDTA method.
4. Determination of DO content of water sample by Winkler's method.
5. Determination of chloride content of water sample by Argentometric method.
6. Determination of strength of given hydrochloric acid using pH meter.
7. Determination of strength of acids in a mixture of acids using conductivity meter.
8. Conductometric titration of barium chloride against sodium sulphate (precipitation titration).
9. Estimation of iron content of the given solution using potentiometer.
10. Estimation of sodium /potassium present in water using a flame photometer.

TOTAL: 30 PERIODS

SVHEC-R2023

Sn
Chairman
BoS / S&H

COURSE OUTCOMES:

At the end of the course the students will be able to

- C01:** Analyse the quality of water samples with respect to their acidity and alkalinity of water samples
- C02:** Examine the water quality parameters like total hardness and DO with volumetric analysis.
- C03:** Learn the permissible limit of chlorine in the given water sample
- C04:** Analyse the impurities in solution by electro analytical techniques quantitatively
- C05:** Determine the amount of metal ions through spectroscopic techniques.

CO's - PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	3	2	1	-	-	3	3	1	-	-	-	1
C02	3	2	2	-	-	3	3	1	-	-	-	1
C03	3	2	1	-	-	3	3	1	-	-	-	1
C04	3	2	2	-	1	2	1	-	-	-	-	-
C05	3	2	1	-	1	2	1	-	-	-	-	-
Avg.	3	2	1	-	1	3	2	1	-	-	-	1

TEXT BOOKS:

1. "Vogel's Textbook of Quantitative Chemical Analysis", (8th Edition, 2014)
2. J. Mendham, R. C. Denney, J.D. Barnes, M. Thomas and B. Sivasankar, "Vogel's Textbook of Quantitative Chemical Analysis", (2009)

23ENL11

ENGLISH LABORATORY
(Common to B.E./B.Tech. all Branches)

L T P C
0 0 2 1

COURSE OBJECTIVES:

- To improve the communicative competence of learners.
- To help learners use language effectively in academic /work contexts.
- To develop various listening strategies to comprehend various types of audio materials like lectures, discussions, videos etc.
- To build on students' English language skills by engaging them in listening, speaking and grammar learning activities those are relevant to authentic contexts.
- To use language efficiently in expressing their opinions via various media.

UNIT-I INTRODUCTION TO FUNDAMENTALS OF COMMUNICATION 6

Listening- Listening for General Information-Specific Details- Conversation: Introduction to Classmates - Audio / Video (Formal & Informal); Telephone Conversation; Listening to Voicemail & Messages; Listening and Filling a Form.

Speaking- Making Telephone Calls- Self Introduction; Introducing a Friend; - Politeness Strategies- Making Polite Requests, Making Polite Offers, Replying to Polite Requests and Offers- Understanding Basic Instructions (Filling out a Bank Application for Example).

UNIT-II NARRATION AND SUMMATION 6

Listening - Listening to Podcasts, Anecdotes / Stories / Event Narration; Documentaries and Interviews with Celebrities.

Speaking - Narrating Personal Experiences / Events-Talking about Current and Temporary Situations & Permanent and Regular Situations - Describing Experiences and Feelings- Engaging in Small Talk- Describing Requirements and Abilities.

UNIT-III DESCRIPTION OF A PROCESS / PRODUCT 6

Listening - Listen to Product and Process Descriptions; A Classroom Lecture; and Advertisements about Products.

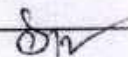
Speaking - Picture Description- Describing Locations in Workplaces- Giving Instruction to Use the Product- Explaining Uses and Purposes- Presenting a Product- Describing Shapes and Sizes and Weights- Talking about Quantities (Large & Small)- Talking about Precautions.

UNIT-IV CLASSIFICATION AND RECOMMENDATIONS 6

Listening - Listening to Technology, Entertainment and Design (TED) Talks; Listening to Lectures - and Educational Videos.

Speaking - Small Talk; Discussing and Making Plans-Talking about Tasks-Talking about Progress- Talking about Positions and Directions of Movement- Talking about Travel Preparations- Talking about Transportation.

SVHEC -R2023


Chairman
BoS / S&H

UNIT-V

EXPRESSION

6

Listening - Listening to Debates/ Discussions; Different Viewpoints on an Issue; and Panel Discussions.

Speaking - Making Predictions- Talking about a Given Topic-Giving Opinions- Understanding a Website- Describing Processes.

TOTAL : 30 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able

- CO1:** To listen to and understand general and complex academic information
- CO2:** To listen to and understand different points of view in a discussion
- CO3:** To speak fluently and accurately in formal and informal communicative contexts
- CO4:** To describe products and processes and explain their uses clearly as well as accurately
- CO5:** To express their opinions effectively in both formal and informal discussions

E. RESOURCES:

- <https://www.ted.com/about/programs-initiatives/ted-talks-education>
- <https://learnenglish.britishcouncil.org/>

CO's & PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	3	3	-	3
CO2	-	-	-	-	-	-	-	-	3	3	-	3
CO3	-	-	-	-	-	-	-	1	2	3	-	2
CO4	-	-	-	-	-	-	-	-	2	3	-	2
CO5	-	-	-	-	-	-	-	1	3	3	-	2
AVR	-	-	-	-	-	-	-	1	3	3	-	2

1 - low, 2 - medium, 3 - high, '-' - no correlation

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23ENT21

PROFESSIONAL ENGLISH - II
(Common to B.E./B.Tech. all Branches)

L	T	P	C
2	0	0	2

COURSE OBJECTIVES:

- To engage learners in meaningful language activities to improve their reading and writing skills.
- To learn various reading strategies and apply in comprehending documents in professional context.
- To help learners understand the purpose, audience, contexts of different types of writing.
- To develop analytical thinking skills for problem solving in communicative contexts.
- To demonstrate an understanding of job applications and interviews for internship and placements.

UNIT-I

MAKING COMPARISONS

6

Reading - Reading Advertisements, User Manuals, Brochures Emails.

Writing - Professional Emails, Email Etiquette - Compare and Contrast Essay.

Grammar - Mixed Tenses, Prepositional Phrase.

UNIT-II

EXPRESSING CAUSAL RELATIONS IN SPEAKING AND WRITING

6

Reading - Reading Longer Technical Texts- Cause and Effect Essays, and Letters / Emails of Complaint.

Writing - Writing Responses to Complaints.

Grammar - Active Passive Voice Transformations, In initive and Gerunds.

UNIT-III

PROBLEM SOLVING

6

Reading - Case Studies, Excerpts from Literary Texts, News Reports etc.

Writing - Letter to the Editor, Checklists, Problem Solution Essay / Argumentative Essay.

Grammar - Error Correction; If Conditional Sentences.

UNIT-IV

CLASSIFICATION AND RECOMMENDATIONS

6

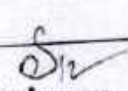
Reading - Newspaper Articles.

Writing - Recommendations, Transcoding, Accident Report, Survey Report

Grammar - Reported Speech, Modals.

Vocabulary - Conjunctions- Use of Prepositions.

SVHEC -R2023


Chairman
BoS / S&H

UNIT-V

EXPRESSION

6

Reading - Company Profiles, Statement of Purpose, (SOP), An Excerpt of Interview with Professionals.

Writing - Job / Internship Application – Cover Letter & Resume.

Grammar - Numerical Adjectives, Relative Clauses.

TOTAL : 30 PERIODS

COURSE OUTCOMES:

At the end of the Course the students will able to

- CO1:** Compare and contrast products and ideas in technical texts.
- CO2:** Identify and report cause and effects in events, industrial processes through technical texts
- CO3:** Analyse problems in order to arrive at feasible solutions and communicate them in the written format
- CO4:** Present their ideas and opinions in a planned and logical manner
- CO5:** Draft effective resumes in the context of job search.

TEXT BOOKS:

1. Department of English, Anna University, "English for Engineers & Technologists" Orient Blackswan Private Ltd, 2020.
2. Dr.Veena Selvam, Dr.Sujatha Priyadarshini, & CO, Department of English, Anna University, "English for Science & Technology" Cambridge University Press, 2021.

REFERENCE BOOKS:

1. Raman, Meenakshi, Sharma & Sangeeta, "Professional English", Oxford University Press, New Delhi, 2019.
2. Dr. V. Chellammal, "Learning to Communicate", Allied Publishers, New Delhi, 2003
3. V.N. Arora and Laxmi Chandra, "Improve Your Writing", Oxford University Press, New Delhi, 2001.

E. RESOURCES:

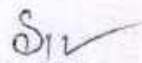
- <https://learnenglish.britishcouncil.org/>

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

CO'S-PO'S MAPPING :

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	1	-	-	-	-	-	1	2	3	-	2
CO2	-	-	-	-	-	-	1	-	3	3	-	3
CO3	-	1	1	-	-	-	-	-	3	3	-	3
CO4	-	-	-	-	-	-	-	-	2	3	-	2
CO5	-	-	-	-	-	-	-	-	2	3	-	2
AVG	-	1	1	-	-	-	1	1	2	3	-	2

1. Low, 2- Medium, 3-High, "-" No Correlation


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23MAT21

NUMERICAL METHODS AND STATISTICS
(Common to B.E./B.Tech. all Branches)

L T P C
3 1 0 4

COURSE OBJECTIVES:

- To introduce the basic concepts of solving algebraic and transcendental equations
- To introduce the numerical techniques of interpolation in various intervals and differentiation and integration in engineering and technology
- To acquaint the knowledge of various techniques and methods of solving ordinary differential equations
- To acquaint the knowledge of testing of hypothesis for small and large samples which plays an important role in real life problems
- To introduce the basic concepts of classifications of design of experiments which plays very important roles in the field of engineering and statistical quality control

UNIT-I SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS 9+3

Solution of algebraic and transcendental equations - Fixed point iteration method - Newton Raphson method- Solution of linear system of equations - Gauss elimination method - Pivoting-Gauss Jordan method - Iterative methods of Gauss Jacobi and Gauss Seidel - Eigen values of a matrix by Power method and Jacobi's method for symmetric matrices.

UNIT-II INTERPOLATION, NUMERICAL DIFFERENTIATION AND 9+3
NUMERICAL INTEGRATION

Lagrange's and Newton's divided difference interpolations - Newton's forward and backward difference interpolation - Approximation of derivatives using interpolation polynomials - Numerical single and double integrations using Trapezoidal and Simpson's 1/3 rules

UNIT-III NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL 9+3
EQUATIONS

Single step methods: Taylor's series method - Euler's method - Modified Euler's method - Fourth order Runge-Kutta method for solving first order differential equations - Multi step methods: Milne's and Adams - Bash forth predictor corrector methods for solving first order differential equations.

UNIT-IV TESTING OF HYPOTHESIS 9+3

Sampling distributions - Tests for single mean, proportion and difference of means (Large and small samples) - Tests for single variance and equality of variances - Chi square test for goodness of fit - Independence of attributes

UNIT-V DESIGN OF EXPERIMENTS 9+3

One way and two way classifications - Completely randomized design - Randomized block design - Latin square design - 2^2 factorial design.

TOTAL : 60 PERIODS

SVHEC- R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

COURSE OUTCOMES:

At the end of the Course the students will be able to

- CO1 :** Apply the numerical techniques of interpolation in various intervals and differentiation and integration for engineering problems
- CO2 :** Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations
- CO3 :** Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications
- CO4 :** Apply the concept of testing of hypothesis for small and large samples in real life problems
- CO5 :** Apply the basic concepts of classifications of design of experiments in the field of agriculture

TEXT BOOKS:

1. Johnson, R.A., Miller, I and Freund J., "Miller and Freund's Probability and Statistics for Engineers", Pearson Education, Asia, 9th Edition, 2023
2. Grewal, B.S., and Grewal, J.S., "Numerical Methods in Engineering and Science", Khanna Publishers, 10th Edition, New Delhi, 2019

REFERENCE BOOKS:

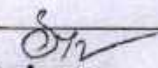
1. Gupta S.C. and Kapoor V. K., "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, New Delhi, 12th Edition, 2020
2. Burden, R.L and Faires, J.D, "Numerical Analysis", 9th Edition, Cengage Learning, 2016
3. Devore. J.L., "Probability and Statistics for Engineering and the Sciences", Cengage
4. Learning, New Delhi, 8th Edition, 2014
5. Walpole. R.E., Myers. R.H., Myers. S.L. and Ye. K., "Probability and Statistics for Engineers and Scientists", 9th Edition, Pearson Education, India, 2022

CO's – PO's MAPPING

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	1	-	-	-	2	-	2	3
CO2	3	3	1	1	1	-	-	-	2	-	2	2
CO3	3	3	1	1	1	-	-	-	2	-	2	3
CO4	3	3	1	1	1	-	-	-	2	-	2	3
CO5	3	2	1	1	1	-	-	-	2	-	3	3
AVG	3	3	1	1	1	-	-	-	2	-	2	3

1- Low, 2- Medium , 3-High, "-" No Correlation

SVHEC- R2023


Chairman
BoS / S&H

23PHT22

MATERIALS SCIENCE
(for B.E. MECH and CIVIL)

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To introduce the basics of heat transfer through different materials, thermal performance of building and various thermal applications
- To impart knowledge on the ventilation and air conditioning of buildings
- To introduce the concepts of sound
- To establish a sound grasp of knowledge on different optical properties of materials, optical displays and applications
- To discuss the basics of new engineering materials

UNIT-I

THERMAL APPLICATIONS

9

Principles of heat transfer, steady state of heat flow, conduction through compound media-series and parallel-conductivity of rubber tube and powder materials - heat transfer through fenestrations, thermal insulation and its benefits - heat gain and heat loss estimation - factors affecting the thermal performance of buildings - central heating.

UNIT-II

VENTILATION AND REFRIGERATION

9

Requirements, principles of natural ventilation - ventilation measurements, design for natural ventilation - Window types and packaged air conditioners - chilled water plant - fan coil systems - water piping - cooling load - Air conditioning systems for different types of buildings - Protection against fire to be caused by A.C. Systems.

UNIT-III

ACOUSTICS

9

Introduction-Classification of sound - Characteristics of sound - decibel- Weber-Fechner law - Sabine's formula- derivation using growth and decay method - Absorption Coefficient and its determination -factors affecting acoustics of buildings and their remedies.

UNIT-IV

OPTICAL PROPERTIES OF MATERIALS

9

Classification of optical materials - Optical processes in semiconductors: optical absorption and emission, charge injection and recombination, optical absorption, loss and gain - Optoelectronic devices: light detectors and solar cells - light emitting diode - laser diode - OLED

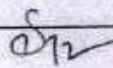
UNIT-V

NEW ENGINEERING MATERIALS

9

Ceramics - types and applications - Composites: classification, role of matrix and reinforcement - processing of fibre reinforced plastics and fibre reinforced metals -

SVHEC-R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

Metallic glasses: Properties, preparation and applications – Shape memory alloys: Characteristics and applications – Carbon nanotubes: Properties and applications

TOTAL: 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1:** Acquire knowledge about heat transfer through different materials, thermal performance of building and thermal insulation
- CO2:** Gain knowledge on the ventilation and air conditioning of buildings
- CO3:** Understand the concepts of sound and its measurements
- CO4:** Understand the optical properties of materials and working principles of various optical devices
- CO5:** Familiarize with ceramics, composites, metallic glasses, shape memory alloys, and their important applications

TEXT BOOKS:

1. Marko Pinteric, "Building Physics", Springer 2021
2. Jasprit Singh, "Semiconductor Optoelectronics: Physics and Technology", Mc-Graw Hill India (2019)
3. M.F.Ashby, P.J.Ferreira and D.L.Schodek. "Nanomaterials, Nanotechnologies and Design: an Introduction for Engineers", 2011

REFERENCE BOOKS:

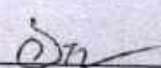
1. Hugo Hens, "Applied Building Physics", Wiley, 2016
2. K.G.Budinski and M.K.Budinski. "Engineering Materials: Properties and Selection", Pearson Education, 2016
3. Pallab Bhattacharya, "Semiconductor Optoelectronic Devices", Pearson, 2017
4. Dr.P.Mani, "Physics for Civil Engineering", Dhanam Publications, 2022

CO's – PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	2	-	1	1	-	-	-	-	-	1
CO2	3	1	2	-	2	1	-	-	-	-	-	1
CO3	3	2	2	1	2	2	1	-	-	-	-	1
CO4	3	1	1	-	2	2	-	-	-	-	-	1
CO5	3	-	2	-	2	2	2	-	-	-	-	1
AVG	3	2	2	1	2	2	2	-	-	-	-	1

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC-R2023


Chairman
BoS / S&H

23EET22	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING (For B.E./B.Tech- CIVIL, CSE, MECH, AI&DS, BME, IT, Pharm.Tech branches)	L	T	P	C
		3	0	0	3

COURSE OBJECTIVES:

- To learn the basic concepts of electric circuits and analysis.
- To analyze the magnetic circuits and domestic wiring.
- To understand the basics of working principles and application of electrical machines.
- To impart knowledge about analog devices and their characteristics.
- To educate on the fundamental concepts of digital electronics.

UNIT-I	ELECTRIC CIRCUITS	10
---------------	--------------------------	-----------

Basic components of electric circuits, Charge, Current, Voltage and Power, Voltage and current sources, Ohm's law, Kirchhoff's laws, Series and parallel connected independent sources, Resistors in series and parallel, Voltage division and current division rule, Mesh current and node voltage methods of analysis-DC Circuits.

UNIT-II	MAGNETIC CIRCUITS AND ELECTRICAL INSTALLATIONS	10
----------------	-------------------------------------------------------	-----------

Magnetic circuits-definitions-MMF, flux, reluctance, Magnetic field intensity, Flux density, Fringing, Self and Mutual inductances-simple problems. Domestic wiring, Wires and Cables - types, Earthing, Protective devices, Switch fuse unit, Safety precautions and First Aid.

UNIT-III	ELECTRICAL MACHINES	10
-----------------	----------------------------	-----------

Construction and working principle- DC generators, EMF equation, Types and applications. Working principle of DC motors, Types and applications. Construction, Working principle and applications of 1 ϕ Transformer, Three phase alternator, Three phase induction motor and Synchronous motor.

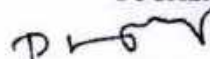
UNIT-IV	ANALOG ELECTRONICS	8
----------------	---------------------------	----------

Resistor, Inductor and Capacitor in electronic circuits, PN Junction diodes, Rectifier, Zener diode-Characteristics-Applications, Construction and characteristics of bipolar junction transistor-Biasing, JFET, MOSFET, IGBT, SCR, Amplifier -Applications.

UNIT-V	DIGITAL ELECTRONICS	7
---------------	----------------------------	----------

Review of number systems, Binary codes, Error detection and correction codes, Combinational logic Circuits, Representation of logic functions-SOP and POS forms, K-map representations, Minimization using K maps - Simple Problems.

TOTAL: 45 PERIODS


Chairman
BoS / EEE

COURSE OUTCOME

At the end of this course the students will be able to:

- CO1 Explain circuit's behavior using circuit laws and analyze the mesh analysis and nodal analysis.
- CO2 Analyze the Magnetic circuits, earthing and wiring.
- CO3 Understand the working principle and applications of electrical machines.
- CO4 Analyze the characteristics of analog electronic devices.
- CO5 Explain the basic concepts of digital electronics.

TEXT BOOKS:

1. D P Kothari and I.J Nagarath, "Basic Electrical and Electronics Engineering", McGraw Hill Education (India) Private Limited, Second Edition, 2020.
2. S.K. Bhattacharya, Basic Electrical Engineering, Pearson Education, 2019.
3. James A Svoboda, Richard C. Dorf, Dorf's Introduction to Electric Circuits, Wiley, 2018.
4. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015.

REFERENCE BOOKS:

1. Muhammad H.Rashid, "Spice for Circuits and electronics", 4th Edition., Cengage India, 2019.
2. Thomas L. Floyd, 'Electronic Devices', 10th Edition, Pearson Education, 2018.
3. John Bird, "Electrical Circuit theory and technology", Routledge; 2017.
4. Albert Malvino, David Bates, 'Electronic Principles, McGraw Hill Education; 7th edition, 2017.
5. H.S. Kalsi, 'Electronic Instrumentation', Tata McGraw-Hill, New Delhi, 2010.

E-RESOURCES:

1. NPTEL-Online Courses and Video lectures: <https://nptel.ac.in/>

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	-	-	-	-	-	1	-	-	3	2	1
CO2	3	3	2	2	-	-	-	-	-	1	-	-	3	3	2
CO3	3	3	3	3	-	-	-	-	-	1	-	-	3	3	3
CO4	3	3	3	3	-	-	-	-	-	1	-	-	3	3	3
CO5	3	3	3	2	-	-	-	-	-	1	-	-	3	3	3
AVG	3	3	2	2	-	-	-	-	-	1	-	-	3	3	2

1 - low, 2 - medium, 3 - high, '-' - no correlation

23MET21	ENGINEERING GRAPHICS (Common to: B.E./B.Tech. all Branches)	L T P C 2 0 4 4
----------------	-----------------------------------------------------------------------	----------------------------------

Course Objectives:

The main learning objective of this course is to prepare the students for:

- Drawing engineering curves.
- Drawing projection of points, lines and plane surface.
- Drawing projection of solids and freehand sketching.
- Drawing of sectioned solids and development of surfaces
- Drawing isometric and perspective projections of simple solids.

CONCEPTS AND CONVENTIONS (Not for Examination)

Importance of graphics in engineering applications - Use of drafting instruments - BIS conventions and specifications — Size, layout and folding of drawing sheets — Lettering and dimensioning.

UNIT-I PLANE CURVES 5+12

Basic Geometrical constructions, Curves used in engineering practices: Conics — Construction of ellipse, parabola and hyperbola by eccentricity method — Construction of cycloid — construction of involutes of square and circle — Drawing of tangents and normal to the above curves.

UNIT-II PROJECTION OF POINTS, LINES AND PLANE SURFACE 6+12

Principal Planes-First angle projection-projection of points. Projection of straight lines (only First angle projections) inclined to both the principal planes - Determination of true lengths and true inclinations by rotating line method and traces. Projection of planes (polygonal and circular surfaces) inclined to both the principal planes by rotating object method.

UNIT-III PROJECTION OF SOLIDS AND FREEHAND SKETCHING 6+12

Projection of simple solids like prisms, pyramids, cylinder, cone and truncated solids when the axis is inclined to one of the principal planes and parallel to the other by rotating object method. Orthographic projection- Freehand sketching of multiple views from pictorial views of objects.

UNIT-IV PROJECTION OF SECTIONED SOLIDS AND DEVELOPMENT OF SURFACES 7+12

Sectioning of above solids in simple vertical position when the cutting plane is inclined to the one of the principal planes and perpendicular to the other — obtaining true shape of section. Development of lateral surfaces of simple and sectioned solids — Prisms, pyramids cylinders and cones.

UNIT-V ISOMETRIC AND PERSPECTIVE PROJECTIONS 6+12

Principles of isometric projection — isometric scale - Isometric projections of simple solids and truncated solids - Prisms, pyramids, cylinders, cones- combination of two solid objects in simple vertical positions - Perspective projection of simple solids-Prisms, pyramids and cylinders by visual ray method.

TOTAL : 90 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1:** Construct the conic curves, involutes and cycloid
- CO2:** Solve practical problems involving projection of lines, Planes.
- CO3:** Draw Projection of solids and can draw freehand sketch.
- CO4:** Draw projection of sectioned solids and development of surfaces
- CO5:** Draw the isometric and perspective projections.

TEXT BOOKS:

1. K Venugopal, Engineering Drawing and Graphics, Sixth edition, New Age International, 2013.
2. Natrajan K.V., "A Text Book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2018.

REFERENCE BOOKS:

1. Basant Agarwal and Agarwal C.M., "Engineering Drawing", McGraw Hill, 2nd Edition, 2019.
2. Gopalakrishna K.R., "Engineering Drawing" (Vol. I&II combined), Subhas Publications, Bangalore, 27th Edition, 2017.
3. Luzzader, Warren.J. and Duff, John M., "Fundamentals of Engineering Drawing with an introduction to Interactive Computer Graphics for Design and Production, Eastern Economy Edition, Prentice Hall of India Pvt. Ltd, New Delhi, 2005.
4. Parthasarathy N. S. and Vela Murali, "Engineering Graphics", Oxford University, Press, New Delhi, 2015.
5. Shah M.B., and Rana B.C., "Engineering Drawing", Pearson Education India, 2nd Edition, 2009.

E-RESOURCES:

1. <https://archive.nptel.ac.in/courses/112/102/112102304/>
2. https://onlinecourses.nptel.ac.in/noc20_me79/preview
3. <https://www.youtube.com/watch?v=ANEvQyt3PnU>

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO2	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO3	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO4	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
CO5	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
Avg	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-

1 - low, 2 - medium, 3 - high, '-' - no correlation

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23TAT21

TAMILS AND TECHNOLOGY
(Common to B.E./B. Tech. all branches)

L T P C
1 0 0 1

COURSE OBJECTIVES:

- To understand about weaving and ceramic technology of Tamils
- To compare the design and constructive technology of Cheras, Cholas, Pallavas and Nayakkars
- To gain knowledge in various manufacturing technology of Tamils
- To analyse the agriculture and fishery knowledge of Tamils
- To learn about scientific Tamil and its usage in online platforms

UNIT-I WEAVING AND CERAMIC TECHNOLOGY 3

Weaving Industry during Sangam Age - Ceramic technology - Black and Red Ware Potteries (BRW) - Graffiti on Potteries.

UNIT-II DESIGN AND CONSTRUCTION TECHNOLOGY 3

Designing and Structural construction House & Designs in household materials during Sangam Age - Building materials and Hero stones of Sangam age - Details of Stage Constructions in Silappathikaram - Sculptures and Temples of Mamallapuram - Great Temples of Cholas and other worship places - Temples of Nayaka Period - Type study (Madurai Meenakshi Temple)- Thirumalai Nayakar Mahal - Chetti Nadu Houses, Indo - Saracenic architecture at Madras during British Period.

UNIT-III MANUFACTURING TECHNOLOGY 3

Art of Ship Building - Metallurgical studies - Iron industry - Iron smelting, steel -Copper and gold- Coins as source of history - Minting of Coins - Beads making-industries Stone beads - Glass beads - Terracotta beads -Shell beads/ bone beads - Archeological evidences - Gem stone types described in Silappathikaram.

UNIT-IV AGRICULTURE AND IRRIGATION TECHNOLOGY 3

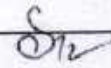
Dam, Tank, ponds, Sluice, Significance of Kumizhi Thoompu of Chola Period, Animal Husbandry - Wells designed for cattle use - Agriculture and Agro Processing - Knowledge of Sea - Fisheries - Pearl - Conche diving - Ancient Knowledge of Ocean - Knowledge Specific Society

UNIT-V SCIENTIFIC TAMIL & TAMIL COMPUTING 3

Development of Scientific Tamil - Tamil computing - Digitalization of Tamil Books - Development of Tamil Software - Tamil Virtual Academy - Tamil Digital Library - Online Tamil Dictionaries - Sorkuvai Project.

TOTAL: 15 PERIODS

SVHEC-R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

COURSE OUTCOMES:

At the end of the course the student will be able to

- CO1:** Relate the weaving ceramic technology of Tamils
- CO2:** Understand the knowledge of Tamils in design and construction technology
- CO3:** Recognize the manufacturing technology knowledge of Tamils
- CO4:** Criticize the agriculture and isherly knowledge of Tamils
- CO5:** Apply scienti ic Tamil in Various online platforms


E- RESOURCES:

- 1. <https://www.tamilvu.org/>
- 2. <https://sorkuvai.com/>

CO's -PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	1	1	1	1	1	-	1
CO2	2	-	-	-	-	2	2	2	2	2	-	2
CO3	2	-	-	-	-	2	2	2	2	2	-	2
CO4	1	-	-	-	-	1	1	1	1	1	-	1
CO5	2	-	-	-	-	2	2	2	2	2	-	2
AVG	2	-	-	-	-	2	2	2	2	2	-	2

SYHEC-R2023


Chairman
BoS / S&H

23TAT21

தமிழரும் தொழில்நுட்பமும்

L T P C
1 0 0 1

(B.E./B.Tech- அனைத்து பாடப்பிரிவுகளுக்கும் பொதுவானது)

பாடநெறி நோக்கங்கள்:

- நெசவு மற்றும் பாணைத்தொழில்நுட்பத்தைப் புரிந்து கொள்ளுதல்
- சேர, சோழ, பல்லவ மற்றும் நாயக்கர்களின் வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பத்தை ஒப்பிடுதல்
- தமிழர்களின் பல்வேறு உற்பத்தி தொழில்நுட்பத்தைப் பற்றிய அறிவைப் பெறுதல்
- தமிழர்களின் வேளாண்மை மற்றும் கடல்சார் அறிவைப் பெற்றுக்கொள்ளுதல்
- அறிவியல் தமிழையும் அதன் இணையப்பயன்பாட்டையும் கற்றல்

அலகு - I

நெசவு மற்றும் கட்டிடத் தொழில்நுட்பம்

3

சங்க காலத்தில் நெசவுத்தொழில் - பாணைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள்சங்க காலத்தில் நெசவுத்தொழில் - பாணைத் தொழில்நுட்பம் - கருப்பு சிவப்பு பாண்டங்கள் - பாண்டங்களில் கீறல் குறியீடுகள்

அலகு - II

வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பம்

3

சங்க காலத்தில் வடிவமைப்பு மற்றும் கட்டுமானங்கள் & சங்க காலத்தில் வீட்டுப் பொருட்களில் வடிவமைப்பு - சங்க காலத்தில் கட்டுமானப்பொருட்களும் நடுகல்லும் - சிலப்பதிகாரத்தில் மேடை அமைப்பு பற்றிய விவரங்கள் - மாமல்லபுரம் சிற்பங்களும் கோவில்களும் - சோழர் காலத்து பெருங்கோயில்கள் மற்றும் பிற வழிபாட்டுத் தலங்கள் - நாயக்கர் காலக் கோயில்கள் - மாதிரி கட்டமைப்புகள் பற்றி அறிதல், மதுரை மீனாட்சி அம்மன் ஆலயம் மற்றும் திருமலை நாயக்கர் மஹால் - செட்டிநாட்டு வீடுகள் - பிரிட்டிஷ் காலத்தில் சென்னையில் இந்தோ - சாரோசெனிக் கட்டிடக் கலை

அலகு - III

உற்பத்தித் தொழில்நுட்பம்

3

கப்பல் காட்டும் கலை - உலோகவியல் - இரும்புத் தொழிற்சாலை - இரும்பை உருக்குதல், எஃகு - வரலாற்றுச் சான்றுகளாக செம்பு மற்றும் தங்க நாணயங்கள் - நாணயங்கள் அச்சடித்தல் - மணி உருவாக்கும் தொழிற்சாலைகள் - கல்மணிகள், கண்ணாடி மணிகள் - சுடுமண் மணிகள் - சங்கு மணிகள் - எலும்புத்துண்டுகள் - தொல்லியல் சான்றுகள் - சிலப்பதிகாரத்தில் மணிகளின் வகைகள்

SVHEC-R2023

Chairman
BeS / S&H

அலகு - IV

வேளாண்மை மற்றும் நீர்பாசனத் தொழில்நுட்பம்

3

அணை, ஏரி, குளங்கள், மதகு - சோழர்காலக் குழுமித் தூம்பின் முக்கியத்துவம் - கால்நடை பராமரிப்பு - கால்நடைகளுக்காக வடிவமைக்கப்பட்ட கிணறுகள் - வேளாண்மை மற்றும் வேளாண்மை சார்ந்த செயல்பாடுகள் - கடல்சார் அறிவு - மீன்வளம் - முத்து மற்றும் முத்துக்குளித்தல் - பெருங்கடல் குறித்த பண்டைய அறிவு - அறிவுசார் சமூகம்

அலகு - V

அறிவியல் தமிழ் மற்றும் கணினித்தமிழ்

3

அறிவியல் தமிழின் வளர்ச்சி - கணினித்தமிழ் வளர்ச்சி - தமிழ் நூல்களை மின்பதிப்பு செய்தல் - தமிழ் மென்பொருட்கள் உருவாக்கம் - தமிழ் இணையக் கல்விக்கழகம் - தமிழ் மின் நூலகம் - இணையத்தில் தமிழ் ஆகராதிகள் - சொற்குவைத் திட்டம்

மொத்தம்: 15 பாடவேளைகள்

பாடநெறி முடிவுகள்:

இப்பாடத்தைப் படிப்பதின் முடிவில் மாணவர்கள்

- C01: நெசவு மற்றும் பாணைத்தொழில்நுட்பத்தை பற்றிப் புரிந்துகொள்வார்கள்
C02: வடிவமைப்பு மற்றும் கட்டிடத் தொழில்நுட்பத்தில் தமிழர்களின் அறிவைப் பெறுவார்கள்
C03: தமிழர்களின் உற்பத்தி தொழில்நுட்பத்தை கண்டறிவார்கள்
C04: தமிழர்களின் வேளாண்மை மற்றும் கடல்சார் அறிவைக் குறித்து விவாதிப்பார்கள்.
C05: பல்வேறு இணையப் பயன்பாடுகளில் அறிவியல் தமிழைப் பயன்படுத்திப்பார்ப்பார்கள்

மின் -ஆதாரங்கள்:

1. <https://www.tamilvu.org/>
2. <https://sorkuvai.com/>

CO's - PO's விவரணையாக்கம்:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	1	-	-	-	-	1	1	1	1	1	-	1
C02	2	-	-	-	-	2	2	2	2	2	-	2
C03	2	-	-	-	-	2	2	2	2	2	-	2
C04	1	-	-	-	-	1	1	1	1	1	-	1
C05	2	-	-	-	-	2	2	2	2	2	-	2
AVG	2	-	-	-	-	2	2	2	2	2	-	2

SVHEC-R2023

On
Chairman
BoS / S&H

23MEL21

ENGINEERING PRACTICES LABORATORY
(Common to: B.E./B.Tech. all Branches)

L T P C
0 0 4 2

Course Objectives:

- Acquire skills in operating hand tools and instruments. Provide hands on training on common household plumbing work and wood work
- Provide hands on training on welding processes.
- Provide hands on training on various simple machining processes. Making a tray out of metal sheet using sheet metal work.
- Wiring various electrical joints in common household electrical wire network.
- Soldering and testing simple electronic circuits. Assembling and testing simple electronic components on PCB.

GROUP – A (CIVIL & MECHANICAL)

I) CIVIL ENGINEERING PRACTICES

(12)

PLUMBING WORK:

Hands-on-exercise:

Basic pipe connections – Mixed pipe material connection – Pipe connections with different joining components - External thread cutting

WOOD WORK:

Hands-on-exercise: Sawing, Planing and Making joints

II) MECHANICAL ENGINEERING PRACTICES

(18)

WELDING WORK:

Fabrication of Models with MS Plate using Arc Welding

BASIC MACHINING WORK:

- a) Simple Turning
- b) Drilling and Tapping Practice

SHEET METAL WORK:

Model making – Trays and funnels

ASSEMBLING AND DISMANTLING WORK:

Assembling a centrifugal pump

GROUP B (ELECTRICAL & ELECTRONICS)

III) ELECTRICAL ENGINEERING PRACTICES

(15)

- a) Introduction to switches, fuses, indicators and lamps - Basic switch board wiring with lamp, fan and three pin socket
- b) Staircase wiring
- c) Fluorescent Lamp wiring with introduction to CFL and LED types.
- d) Energy meter wiring and related calculations/ calibration
- e) Study of Iron Box wiring and assembly
- f) Study of Fan Regulator (Resistor type and Electronic type using Diac/Triac/quadrac)
- g) Study of emergency lamp wiring/Water heater

IV) ELECTRONIC ENGINEERING PRACTICES

(15)

SOLDERING WORK:

Soldering simple electronic circuits and checking continuity

ELECTRONIC ASSEMBLY AND TESTING WORK:

Assembling and testing electronic components on a small PCB

ELECTRONIC EQUIPMENT STUDY:

- Study elements of smart phone
- Assembly and dismantle of LED TV
- Assembly and dismantle of computer/ laptop

TOTAL : 60 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- Make a wooden model using carpentry Process.
- Make various shapes using welding processes.
- Make various shapes using manufacturing processes like machining and sheet metal work.
- Wires various electrical joints in common household electrical wire network.
- Solder and test simple electronic circuits. Assemble and test simple electronic components on PCB.

REFERENCE:

- Manual prepared by the faculty of Civil, Mechanical, Electrical and Electronics and Communication Engineering Department, SVHEC.

E-RESOURCES:

- <https://www.youtube.com/watch?v=GPnQjCrb83Y>
- <https://www.youtube.com/watch?v=njwdsMI3PcY>

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO2	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO3	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO4	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
CO5	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1
Avg	3	-	-	3	-	-	-	-	-	-	-	-	2	1	1

1 - low, 2 - medium, 3 - high, '-' - no correlation

23EEL22

**BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
LABORATORY**

L	T	P	C
0	0	4	2

(for B.E./B.Tech- CIVIL, MECH, Pharm.Tech branches)

COURSE OBJECTIVES:

- To train the students in conducting load tests on electrical machines.
- To gain practical experience in characterizing electronic devices.
- To train the students to use DSO for measurements.

LIST OF EXPERIMENTS

1. Verification of ohms and Kirchhoff's Laws.
2. Speed control of DC Shunt Motor.
3. Load test on Self Excited DC Shunt Generator.
4. Load test on Single phase Transformer.
5. Load Test on 1Ø Induction Motor.
6. Characteristics of PN and Zener Diodes.
7. Characteristics of BJT and MOSFET.
8. Characteristics of SCR.
9. Half wave and Full Wave rectifiers.
10. Implementation of Binary Adder and Subtractor.
11. Study of Logic Gates.
12. Study of DSO.

TOTAL: 60 PERIODS

COURSE OUTCOMES

At the end of this course the students will be able to

- C01** Verify the Ohm's and Kirchhoff's Laws.
- C02** Analyze experimentally the load characteristics of electrical machines.
- C03** Analyze the characteristics of basic electrical devices.
- C04** Use DSO to measure the various parameters.
- C05** Analyze the characteristics of basic electronic devices.

SVHEC-R2023


**Chairman
BoS / EEE**

REFERENCE BOOKS:

1. SVHEC- Basic Electrical and Electronics Engineering Laboratory Manual.

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01	3	3	2	1	1	-	-	-	2	-	-	-	3	3	-
C02	3	3	2	1	1	-	-	-	2	-	-	-	3	3	-
C03	3	3	2	1	1	-	-	-	2	-	-	-	3	1	-
C04	3	3	2	1	1	-	-	-	2	-	-	-	3	1	-
C05	3	3	2	1	1	-	-	-	2	-	-	-	3	1	-
AVG	3	3	2	1	1	-	-	-	2	-	-	-	3	2	-

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS/EEE

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23ENL21

COMMUNICATION LABORATORY
(Common to B.E./B.Tech. all Branches)

L	T	P	C
0	0	4	2

COURSE OBJECTIVES:

- To identify varied group discussion skills and apply them to take part in effective discussions in a professional context.
- To analyse concepts and problems and make effective presentations explaining them clearly and precisely.
- To be able to communicate effectively through formal and informal writing.
- To be able to use appropriate language structures to write emails, reports and essays
- To give instructions and recommendations that are clear and relevant to the context

UNIT-I

MAKING COMPARISONS

12

Speaking - Role Play Exercises Based on Workplace Contexts- Talking about Competition- Discussing Progress toward Goals- Talking about Experiences- Talking about Events in Life-Discussing Past Events.

Writing - Writing Emails (Formal & Semi-Formal)

UNIT-II

**EXPRESSING CAUSAL RELATIONS IN SPEAKING AND
WRITING**

12

Speaking - Discussing News Stories - Talking about Frequency- Talking about Travel Problems-Discussing Travel Procedures- Talking about Travel Problems- Making Arrangements-Describing Arrangements- Arrangements Discussing Plans and Decisions-Discussing Purposes and Reasons- Understanding Common Technology Terms.

Writing -Writing Different Types of Emails.

UNIT-III

PROBLEM SOLVING

12

Speaking - Discussing Predictions- Describing the Climate- Discussing Forecasts and Scenarios- Talking about Purchasing- Discussing Advantages and Disadvantages- Making Comparisons- Discussing Likes and Dislikes- Discussing Feelings about Experiences-Discussing Imaginary Scenarios.

Writing - Short Essays and Reports- Formal/Semi-Formal letters.

UNIT-IV

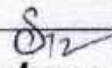
CLASSIFICATION AND RECOMMENDATIONS

12

Speaking - Discussing the Natural Environment- Describing Systems- Describing Position and Movement Explaining Rules (Example- Discussing Rental Arrangements)- Understanding Technical Instructions.

Writing - Writing Instructions -Writing a Short Article.

SVHEC- R2023


Chairman
Bos / S&H

UNIT-V

EXPRESSION

12

Reading - Describing Things Relatively-Describing Clothing-Discussing Safety Issues (Making Recommendations) Talking about Electrical Devices-Describing Controlling Actions.

Writing - Job Application (Cover Letter + Curriculum Vitae) – Writing Recommendations.

TOTAL : 60 PERIODS

COURSE OUTCOMES:

At the end of the Course the students will able to

- CO1:** Speak effectively in group discussions held in a formal/semi formal contexts
- CO2:** Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions
- CO3:** Create emails, letters and effective job applications with resume.
- CO4:** Write critical reports to convey data and information with clarity and precision
- CO5:** Deliver suitable instructions and recommendations for safe execution of tasks

E-RESOURCES:

- <https://www.englishclub.com/speaking/>
- <https://learnenglish.britishcouncil.org/>

CO's-PO's MAPPING :

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	-	-	-	-	-	-	-	-	3	3	-	3
CO2	-	-	2	-	-	-	-	-	3	3	-	3
CO3	-	-	-	-	-	-	-	-	3	3	-	2
CO4	-	-	-	-	-	-	-	-	3	3	-	3
CO5	-	-	1	-	-	-	-	1	3	3	-	2
AVG	-	-	2	-	-	-	-	1	3	3	-	3

1- Low, 2- Medium, 3-High, "-" No Correlation

SVHEC- R2023

Permitted
Signature


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23MDC21	YOGA FOR HUMAN EXCELLENCE (Common to B.E./B.Tech. all Branches)	L T P C 0 0 1 0
UNIT-I	SIMPLIFIED PHYSICAL EXERCISES	3
Physical exercises: Hand exercises – Leg exercises. Breathing exercises: Eye exercises – Kapalabathi. Makarasana. Body massages: Acupressure – Relaxation.		
UNIT-II	KAYA KALPA	3
Kaya Kalpa Exercise – Aswini Mudra – Moola Bandha – Ojas Breath (Kayakalpa Exercise should be learnt directly from the World Community Service Centre.)		
UNIT-III	MEDITATION	3
Agna. Santhi : Clearence. Thuriya. Thuriyatheetam meditation		
UNIT-IV	HUMAN RESOURCES DEVELOPMENT	3
Eradication of worries – Bene its of Blessings – Greatness of Friendship – Neutralization of anger – Individual peace and world peace		
UNIT-V	YOGASANAS	3
Suriya Namaskar, Padmasana, Vajrasana, Sukasana, Chakrasana (side posture), Viruchasana, Bhujangasana, Yoga mudra, Ustrasana, Maha Mudra, Vakkarasana.		
TOTAL : 15 PERIODS		

TEXT BOOKS:

1. Yoga Practices – I: VISION, Vethathiri Publications.
2. Yogasana – Vethathiri Publications

REFERENCE BOOKS:

1. Simplified Physical Exercises – Vethathiri Publications.
2. Sound health through yoga – Dr. K. Chandrasekaran.


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

23MAT32 TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS
(for B.E. CIVIL, MECH & BME)

L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

- To introduce the basic concepts of PDE for solving standard partial differential equations.
- To introduce Fourier series analysis which is central to many applications in engineering apart from its use in solving boundary value problems.
- To acquaint the student with Fourier series techniques in solving heat flow problems used in various situations
- To acquaint the student with Fourier, transform techniques used in wide variety of situations
- To introduce the effective mathematical tools for the solutions of partial differential equations that model several physical processes and to develop Z transform techniques for discrete time systems.

UNIT-I PARTIAL DIFFERENTIAL EQUATIONS 9+3

Formation of partial differential equations - Solutions of standard types of first order partial differential equations - First order partial differential equations reducible to standard types- Lagrange's linear equation

UNIT-II FOURIER SERIES 9+3

Dirichlet's conditions - General Fourier series - Odd and even functions - Half range sine series
and cosine series - Root mean square value - Parseval's identity - Harmonic analysis.

UNIT-III APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS 9+3

Classification of PDE - Method of separation of variables - Fourier series solutions of one- dimensional wave equation - One dimensional equation of heat conduction

UNIT-IV FOURIER TRANSFORMS 9+3

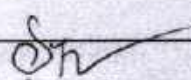
Statement of Fourier integral theorem- Fourier transform pair - Fourier sine and cosine transforms - Properties - Transforms of simple functions - Convolution theorem - Parseval's identity.

UNIT-V Z - TRANSFORMS AND DIFFERENCE EQUATIONS 9+3

Z-transforms - Elementary properties - Convergence of Z-transforms - Initial and final value theorems - Inverse Z-transform using partial fraction and convolution theorem - Formation of difference equations - Solution of difference equations using Z - transforms

TOTAL : 60 PERIODS

SVHEC - R2023


Chairman
BoS / S&H

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

COURSE OUTCOMES:

Upon successful completion of the course, students should be able to:

- CO1:** Understand how to solve the given standard partial differential equations.
- CO2:** Solve differential equations using Fourier series analysis which plays a vital role in engineering applications.
- CO3:** Appreciate the physical significance of Fourier series techniques in solving one dimensional heat flow problems and one-dimensional wave equations
- CO4:** Understand the mathematical principles on transforms and partial differential equations would provide them the ability to formulate and solve some of the physical problems of engineering
- CO5:** Use the effective mathematical tools for the solutions of partial differential equations by using Z transform techniques for discrete time systems

TEXT BOOKS:

1. Grewal B.S., "Higher Engineering Mathematics", 44th Edition, Khanna Publishers, New Delhi, 2023.
2. Kreyszig E, "Advanced Engineering Mathematics", 10th Edition, John Wiley, New Delhi, India, 2023.

REFERENCE BOOKS:

1. Bali. N.P and Manish Goyal, "A Textbook of Engineering Mathematics", 10th Edition, Laxmi Publications Pvt. Ltd, 2021.
2. James. Glyn., "Advanced Modern Engineering Mathematics", 5th Edition, Pearson Education, New Delhi, 2018.
3. Ramana. B.V., "Higher Engineering Mathematics", McGraw Hill Education Pvt. Ltd, New Delhi, 2018.
4. Wylie. R.C. and Barrett. L.C., "Advanced Engineering Mathematics" Tata McGraw Hill Education Pvt. Ltd, 6th Edition, New Delhi, 2012

E-RESOURCES:

1. https://onlinecourses.nptel.ac.in/noc24_ma37/preview
2. https://onlinecourses.nptel.ac.in/noc24_ma20/preview

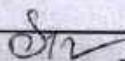
CO's - PO's MAPPING:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1	1	-	-	-	-	2	-	-	3
CO2	3	3	1	1	-	-	-	-	2	-	-	3
CO3	3	3	1	1	-	-	-	-	2	-	-	3
CO4	3	3	1	1	-	-	-	-	2	-	-	3
CO5	3	3	1	1	-	-	-	-	2	-	-	3
Avg	3	3	1	1	-	-	-	-	2	-	-	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

SVHEC - R2023

18/05/2023
18/05/2023


Chairman
BoS / S&H

23MET31

ENGINEERING MECHANICS

L	T	P	C
2	1	0	3

Course Objectives:

The main learning objective of this course is to prepare the students to:

- To Learn the use scalar and vector analytical techniques for analyzing forces in statically determinate structures
- To introduce the equilibrium of rigid bodies, vector methods and free body diagram
- To study and understand the distributed forces, surface, loading on beam and intensity.
- To learn the principles of friction, forces and to determine the apply the concepts of frictional forces at the contact surfaces of various engineering systems.
- To develop basic dynamics concepts – force, momentum, work and energy;

UNIT-I BASICS AND STATICS OF PARTICLES

9

Introduction – Units and Dimensions – Laws of Mechanics – Statics of Particles - Forces in a Plane, Resultant of Forces, Resolution of A Force into Components, Rectangular Components of a Force, unit vectors. Equilibrium of a particle- newton's first law of motion, Space and Free-Body Diagrams, forces in space, equilibrium of a particle in space.

UNIT-II EQUILIBRIUM OF RIGID BODIES

9

Free body diagram – Types of supports –Action and reaction forces –Stable equilibrium – Moments and Couples – Moment of a force about a point and about an axis – Vectorial representation of moments and couples – Scalar components of a moment – Varignon's theorem – Single equivalent force - Equilibrium of Rigid bodies in two dimensions – Analysis of trusses using method of joints - Equilibrium of Rigid bodies in three dimensions.

UNIT-III PROPERTIES OF SURFACES AND SOLIDS

9

Determination of Areas and Volumes – First moment of area and Centroid of sections – T section- I section- Angle section Hollow section from primary simpler sections – Second moment of plane areas – Parallel axis theorem and Perpendicular axis theorem – T section- I section- Angle section- Hollow section – Polar moment of Inertia – Product of Inertia-Principal Moment of Inertia of plane area- Mass moment of inertia

UNIT-IV FRICTION

9

The laws of dry friction, coefficients of friction, angles of friction, wedge friction, wheel friction, rolling resistance, ladder friction.

UNIT-V DYNAMICS OF PARTICLES

9

Kinematics - rectilinear motion and curvilinear motion of particles. Kinetics- newton's second law of motion -equations of motions, Dynamic equilibrium, energy and momentum methods - work of a force, Kinetic Energy of a Particle, Principle of Work and Energy, Principle of Impulse and Momentum, Impact of bodies.

TOTAL : 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1:** Illustrate the vector and scalar representation of forces and moments
- CO2:** Analyse the rigid body in equilibrium
- CO3:** Evaluate the properties of distributed forces
- CO4:** Determine the friction and the effects by the laws of friction
- CO5:** Calculate dynamic forces exerted in rigid body

TEXT BOOKS:

- Beer Ferdinand P, Russel Johnston Jr., David F Mazurek, Philip J Cornwell, SanjeevSanghi, "Vector Mechanics for Engineers: Statics and Dynamics", McGraw Higher Education., 12thEdition, 2019.
- Kumaravelan R. and Yugananth P., "Engineering Mechanics", 2nd Edition, Scitech Publications, 2015.
- Vela Murali, "Engineering Mechanics-Statics and Dynamics", Oxford University Press, 2018.

REFERENCE BOOKS:

- Hibbeler, R.C., "Engineering Mechanics: Statics, and Engineering Mechanics: Dynamics", 13th edition, Prentice Hall, 2013.
- Timoshenko S, Young D H, Rao J V and SukumarPatil, "Engineering Mechanics", 5thEdition, McGraw HillHigher Education, 2013.
- Kottiswaran N., "Engineering Mechanics Statics and Dynamics", 10th Edition, Sri Balaji Publications Pvt.Ltd., 2013.

E-RESOURCES:

- <https://nptel.ac.in/courses/112106180>
- <https://www.youtube.com/watch?v=nGfVTNfNwnk>

CO's - PO's & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	1	-	-	-	-	-	-	2	3	1	-
CO2	3	2	2	1	1	-	-	-	-	-	-	2	3	1	-
CO3	3	2	3	1	1	-	-	-	-	-	-	2	3	1	-
CO4	3	2	3	1	1	-	-	-	-	-	-	2	3	1	-
CO5	3	2	3	1	1	-	-	-	-	-	-	2	3	1	-
Avg	3	2	2.6	1	1	-	-	-	-	-	-	2	3	1	-

1 - low, 2 - medium, 3 - high, '-' - no correlation

23CET31

FLUID MECHANICS

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- Introduce the students about properties and behaviour of the fluids under static conditions.
- Impart basic knowledge of the dynamics of fluids through the control volume approach.
- Expose to the applications of the conservation laws to a) flow measurements b) flow through pipes (both laminar and turbulent) and c) forces on pipe bends
- Significance of boundary layer theory and its applications
- Understand the Fundamental dimensions and Model studies

UNIT-I

FLUIDS PROPERTIES AND FLUID STATICS

10

Scope of fluid mechanics – Definitions of a fluid – Methods of analysis – Continuum hypothesis – System and Control volume approach – Reynold's transportation theorem – Fluid properties – Fluid statics – Manometry – Forces on plane and curved surfaces – Buoyancy and floatation – Stability of floating bodies.

UNIT-II

BASIC CONCEPTS OF FLUID FLOW

10

Kinematics: Classification of flows – Streamline, streak-line and path-lines – Stream function and velocity potentials – Flow nets;

Dynamics : Application of control volume to continuity, energy and momentum – Euler's equation of motion along a stream line – Bernoulli's equation – Applications to velocity and discharge measurements – Linear momentum equation – Application to Pipe bends – Moment of momentum equation.

UNIT-III

INCOMPRESSIBLE VISCOUS FLOW

8

Reynolds experiment – Laminar flow in pipes and between parallel plates – Development of laminar and turbulent flows in pipes – Darcy-Weisbach equation – Moody diagram – Major and minor losses of flow in pipes – Total energy line – Hydraulic grade line – Siphon – Pipes in series and parallel – Equivalent pipes.

UNIT-IV

BOUNDARY LAYERS

9

Definition of boundary layers – Laminar and turbulent boundary layers – Displacement, momentum and energy thickness – Momentum integral equation – Applications – Separation of boundary layer – Drag and Lift forces.

UNIT-V

DIMENSIONAL ANALYSIS AND MODEL STUDIES

8

Fundamental dimensions – Dimensional homogeneity – Rayleigh's method and Buckingham Pi theorem – Dimensionless parameters – Similitude and model studies – Distorted and undistorted models.

TOTAL : 45 PERIODS


Chairman
BoS / Civil

COURSE OUTCOMES:

At the end of the course the students will be able to

- C01 :** Demonstrate the difference between solid and fluid, its properties and behaviour in static conditions
- C02 :** Apply the conservation laws applicable to fluids and its application through fluid kinematics and dynamics
- C03 :** Estimate the losses in pipelines for both laminar and turbulent conditions and analysis of pipes connected in series and parallel.
- C04 :** Explain the concept of boundary layer and its application to find the drag force exerted by the fluid on the flat solid surface.
- C05 :** Formulate the relationship among the parameters involved in the given fluid phenomenon and to predict the performance of prototypes by model studies.

TEXT BOOKS:

1. Modi P.N and Seth Hydraulics and Fluid Mechanics including Hydraulic Machines Standard Book House New Delhi. 2015.
2. Streeter, V.L. Wylie, E. B. and Bedford K.W, Fluid Mechanics. (9th Ed.) Tata McGraw Hill, New Delhi, 1998

REFERENCE BOOKS:

1. S K Som; Gautam Biswas and S Chakraborty, Introduction to Fluid Mechanics and Fluid Machines, Tata McGraw Hill Education Pvt. Ltd., 2012.
2. Pani B S, Fluid Mechanics: A Concise Introduction, Prentice Hall of India Private Ltd, 2016.
3. Jain A. K. Fluid Mechanics including Hydraulic Machines, Khanna Publishers, New Delhi, 2014.
4. Narayana Pillai N. Principles of Fluid Mechanics and Fluid Machines, (3rd Ed.) University Press (India) Pvt. Ltd. 2009

E-RESOURCES:

1. <https://archive.nptel.ac.in/courses/105/103/105103192/>
2. <https://nptel.ac.in/courses/112104118>

CO's - PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	3	3	-	-	-	3	2	-	2	-	-	2	-	-	-
C02	3	3	-	-	-	2	2	-	2	-	-	-	-	-	3
C03	3	3	-	2	3	2	-	-	2	-	-	-	-	-	3
C04	3	3	-	3	3	2	3	-	-	-	-	-	-	-	3
C05	3	3	-	2	3	-	3	-	2	-	-	-	-	-	3

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS / Civil

23CET32

CONSTRUCTION MATERIALS AND TECHNOLOGY

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To identify the good quality brick, stone and blocks for construction.
- To recognize the market forms of timber, steel, aluminum and applications of various composite materials
- To classify the best construction and service such as thermal insulations and air conditioning of the building
- To select various equipments for construction works conditioning of building
- To discuss the basic principles and practices involved in construction.

UNIT-I

STONES - BRICKS - CONCRETE BLOCKS - LIME

10

Stone as building material – Criteria for selection – Tests on stones – Bricks – Classification – Manufacturing of clay bricks – Tests on bricks – Compressive strength – Water Absorption – Efflorescence – Lime – Preparation of lime mortar – Concrete hollow blocks – Lightweight concrete blocks

UNIT-II

CEMENT AND CONCRETE

10

Cement – manufacturing of cement – constitution of concrete – Timber – Market forms – Plywood – Veneer – False ceiling materials – Steel – Mechanical treatment – Aluminum – Uses – Market forms – Glass – Ceramics – Refractories – Composite Materials – Types and applications – FRP – Fibre textiles – Geo-membranes and Geotextiles for earth reinforcement.

UNIT-III

OTHER MATERIALS

10

Types of Foundations – Shallow and Deep Foundations – Stone Masonry – Brick Masonry – Plastering and Pointing – Cavity Walls – Diaphragm Walls – Formwork – Centering and Shuttering – Shoring – Scaffolding – Underpinning – Roofing – Flooring – Joints in concrete – Contraction/Construction/Expansion joints – Fire Protection – Thermal Insulation – Ventilation and Air conditioning – Acoustics and Sound Insulation – Damp Proofing.

UNIT-IV

CONSTRUCTION EQUIPMENTS

7

Selection of equipment for earthwork excavation, concreting, material handling and erection of structures – Dewatering and pumping equipment.

UNIT-V

GENERAL CONSTRUCTION PRACTICES

8

Site Preparation and Setting Out of works–Earthwork Operation Basics–Earthwork Equipment–Construction of Shallow and Deep Foundations–Masonry–Types & Construction–Flooring–DPC and Waterproofing Techniques

TOTAL : 45 PERIODS


Chairman
BoS / Civil

COURSE OUTCOMES:

At the end of the course the students will be able to

- C01:** Identify the good quality brick, stone and blocks for construction.
- C02:** Recognize the market forms of timber, steel, aluminum and applications of various composite materials.
- C03:** Identify the best construction and service such as thermal insulations and air conditioning of the building
- C04:** Select various equipment's for construction works conditioning of building
- C05:** Basic principles and practices involved in construction

TEXT BOOKS:

1. Varghese.P.C, Building Materials, Second Edition PHI Learning Ltd., 2015.
2. Arora S.P and Bindra S.P Building construction, Dhanpat Rai and sons, 2013.

REFERENCE BOOKS:

1. Varghese.P.C, Building Construction, Second Edition PHI Learning Ltd., 2016.
2. Punmia ,B.C Building construction , Laxmi publication (p)ltd.,2008.
3. Peurifoy R.L., Schexnayder,C.J., Shapira A., Schmitt.R., Construction Planning Equipment and Methods, Tata McGraw-hill, 2011.
4. Srinath L.S.,PERT and CPM -Principles and applications, Affiliated East West Press 2001

E-RESOURCES:

1. <https://archive.nptel.ac.in/courses/105/102/105102088/>
2. <https://archive.nptel.ac.in/courses/105/106/105106053/>

CO's - PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	2	2	-	3	-	2	2	-	-	-	-	2	3	-	-
C02	3	-	-	2	-	-	2	-	-	-	-	2	3	-	2
C03	3	-	-	2	-	-	3	-	-	-	2	-	3	-	2
C04	2	-	-	-	-	-	-	-	-	-	2	-	3	3	-
C05	2	3	2	3	2	2	-	-	2	-	3	2	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

dyf.
Chairman
BoS / Civil

23CET33

WATER SUPPLY AND WASTEWATER ENGINEERING

L	T	P	C
4	0	0	4

COURSE OBJECTIVES:

- To understand the various components of water supply scheme and design of intake structure and conveyance system for water transmission
- To recognize on the characteristics and composition of sewage, ability to estimate sewage generation and design sewer system including sewage pumping stations
- To appreciate the process of conventional treatment and design of water and wastewater treatment system and gain knowledge of selection of treatment process and biological treatment process
- Capable to design and evaluate water distribution system and water supply in buildings and understand the self-purification of streams and sludge and septage disposal methods.
- Competent to understand and design the various advanced treatment system and knowledge about the recent advances in water and wastewater treatment process and reuse of sewage

UNIT-I

WATER SUPPLY

12

Estimation of surface and subsurface water resources - Predicting demand for water- Impurities of water and their significance - Physical, chemical and bacteriological analysis - Waterborne diseases - Standards for potable water. Intake of water: Pumping and gravity schemes.

UNIT-II

WATER TREATMENT

12

Objectives - Unit operations and processes - Principles, functions, and design of water treatment plant units, aerators of flash mixers, Coagulation and flocculation - Clarifloccuator - Plate and tube settlers - Pulsator clarifier - sand filters - Disinfection - softening, removal of iron and manganese - Defluoridation - Softening - Desalination process - Residue Management - Construction, Operation and Maintenance aspects

UNIT-III

WATER STORAGE AND DISTRIBUTION

12

Storage and balancing reservoirs - types, location and capacity. Distribution system: layout, hydraulics of pipe lines, pipe fittings, valves including check and pressure reducing valves, meters, analysis of distribution systems, leak detection, maintenance of distribution systems, pumping stations and their operations - House service connections.


Chairman
BoS / Civil

UNIT-IV

PLANNING AND DESIGN OF SEWERAGE SYSTEM

12

Characteristics and composition of sewage - Population equivalent - Sanitary sewage flow estimation - Sewer materials - Hydraulics of flow in sanitary sewers - Sewer design - Storm drainage-Storm runoff estimation - Sewer appurtenances - Corrosion in sewers - Prevention and control - Sewage pumping-drainage in buildings - Plumbing systems for drainage

UNIT-V

SEWAGE TREATMENT AND DISPOSAL

12

Objectives - Selection of Treatment Methods - Principles, Functions, - Activated Sludge Process and Extended aeration systems - Trickling filters - Sequencing Batch Reactor(SBR) - UASB - Waste Stabilization Ponds - Other treatment methods - Reclamation and Reuse of sewage - Recent Advances in Sewage Treatment - Construction, Operation and Maintenance aspects. - Discharge standards-sludge treatment -Disposal of sludge - Septic tank with dispersion.

TOTAL : 60 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1 :** Understand the various components of water supply scheme and design of intake structure and conveyance system for water transmission
- CO2 :** Recognize on the characteristics and composition of sewage, ability to estimate sewage generation and design sewer system including sewage pumping stations
Appreciate the process of conventional treatment and design of water and wastewater
- CO3 :** treatment system and gain knowledge of selection of treatment process and biological treatment process
- CO4 :** Ability to design and evaluate water distribution system and water supply in buildings and understand the self-purification of streams and sludge and septage disposal methods.
Competent to understand and design the various advanced treatment system and
- CO5 :** knowledge about the recent advances in water and wastewater treatment process and reuse of sewage

TEXT BOOKS:

1. Garg, S.K. Environmental Engineering, Vol.I Khanna Publishers, New Delhi, 2010.
2. Modi, P.N., Water Supply Engineering, Vol.I Standard Book House, New Delhi, 2016.
3. Garg, S.K., Environmental Engineering Vol.II, Khanna Publishers, New Delhi, 2015.
4. Duggal K.N., "Elements of Environmental Engineering" S. Chand and Co. Ltd., New Delhi, 2014.
5. Punmia, B.C., Jain, A.K., and Jain.A.K., Environmental Engineering, Vol.II, Laxmi Publications, 2010.

Def.
Chairman
BoS / Civil

REFERENCE BOOKS:

1. Punmia B.C, Ashok Jain and Arun Jain, Water Supply Engineering, Laxmi Publications (P) Ltd., New Delhi 2010.
2. Manual on Water Supply and Treatment, CPHEEO, Ministry of Urban Development, Government of India, New Delhi, 1999.
3. Syed R. Qasim and Edward M. Motley Guang Zhu, Water Works Engineering Planning, Design and Operation, Prentice Hall of India Learning Private Limited, New Delhi, 2009.
4. Of Urban Development, Government of India, New Delhi, 2013.
5. Metcalf and Eddy – Waste water Engineering – Treatment and Reuse, Tata Mc. Graw – Hill Company, New Delhi, 2010.
6. Syed R. Qasim "Waste water Treatment Plants", CRC Press, Washington D.C., 2010
7. Gray N.F, "Water Technology", Elsevier India Pvt. Ltd. New Delhi, 2006.

E-RESOURCES:

1. <https://archive.nptel.ac.in/courses/105/105/105105201/>
2. <https://archive.nptel.ac.in/courses/105/106/105106119/>

CO's – PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	3	-	2	-	-	-	1	1	-	-	-	3	-	-
CO2	2	3	-	2	-	-	-	1	1	-	-	-	3	-	-
CO3	3	3	3	-	-	3	2	2	2	-	2	-	3	2	2
CO4	3	3	3	-	2	3	3	2	3	-	2	-	3	2	3
CO5	3	3	3	2	2	3	3	2	3	2	2	3	3	2	3

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS / Civil

23CET34

SURVEYING AND LEVELLING

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To familiarize the rudiments of various surveying and its principles.
- To Introduce the rudiments of various surveying and its principles
- To Imparts concepts of Theodolite Surveying for complex surveying operation
- To understand the procedure for establishing horizontal and vertical control
- To Imparts the knowledge on modern surveying instruments

UNIT-I

FUNDAMENTALS OF CONVENTIONAL SURVEYING

12

Definition – Classifications – Basic principles – Equipment and accessories for ranging and chaining – Methods of ranging – Well conditioned triangles – Chain traversing – Compass – Basic principles – Types – Bearing – System and conversions – Sources of errors and Local attraction – Magnetic declination – Dip – compass traversing – Plane table and its accessories – Merits and demerits – Radiation – Intersection – Resection – Plane table traversing.

UNIT-II

LEVELLING

8

Level line – Horizontal line – Datum – Benchmarks – Levels and staves – Temporary and permanent adjustments – Methods of leveling – Fly leveling – Check leveling – Procedure in leveling – Booking – Reduction – Curvature and refraction – Reciprocal leveling – Precise leveling – Contouring

UNIT-III

THEODOLITE SURVEYING

8

Horizontal and vertical angle measurements – Temporary and permanent adjustments – Heights and distances – Tacheometric surveying – Stadia Tacheometry – Tangential Tacheometry – Trigonometric leveling – Single Plane method – Double Plane method.

UNIT-IV

CONTROL SURVEYING AND ADJUSTMENT

8

Horizontal and vertical control – Methods – Triangulation – Traversing – Gale's table – Trilateration – Concepts of measurements and errors – Error propagation and Linearization – Adjustment methods - Least square methods – Angles, lengths and levelling network.

UNIT-V

MODERN SURVEYING

9

Total Station: Digital Theodolite, EDM, Electronic field book – Advantages – Parts and accessories – Working principle – Observables – Errors - COGO functions – Field procedure and applications. GPS: Advantages – System components – Signal structure – Selective availability and antispoofing receiver components and antenna – Planning and data acquisition – Data processing – Errors in GPS – Field procedure and applications – Overview of LADDER Survey.

TOTAL : 45 PERIODS


Chairman
BoS / Civil

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1 :** Familiarize the rudiments of various surveying and its principles.
- CO2 :** Introduce the rudiments of various surveying and its principles.
- CO3 :** Imparts concepts of Theodolite Surveying for complex surveying operations
- CO4 :** Understand the procedure for establishing horizontal and vertical control
- CO5 :** Imparts the knowledge on modern surveying instruments

TEXT BOOKS:

1. Dr. B. C. Punmia, Ashok K. Jain and Arun K Jain, Surveying Vol. I & II, Lakshmi Publications Pvt Ltd, New Delhi, Sixteenth Edition, 2016.
2. T. P. Kanetkar and S. V. Kulkarni, Surveying and Levelling, Parts 1 & 2, Pune Vidyarthi Griha Prakashan, Pune, 2008.

REFERENCE BOOKS:

1. R. Subramanian, Surveying and Levelling, Oxford University Press, Second Edition, 2012.
2. James M. Anderson and Edward M. Mikhail, Surveying, Theory and Practice, Seventh Edition, Mc Graw Hill 2001.
3. Bannister and S. Raymond, Surveying, Seventh Edition, Longman 2004.
4. S. K. Roy, Fundamentals of Surveying, Second Edition, Prentice Hall of India 2010.
5. K. R. Arora, Surveying Vol I & II, Standard Book house, Twelfth Edition 2013.
6. C. Venkatramaiah, Textbook of Surveying, Universities Press, Second Edition, 2011.

E-RESOURCES:

1. <https://archive.nptel.ac.in/courses/105/104/105104101/>
2. <https://nptel.ac.in/courses/105107122>

CO's – PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	2	3	2	2	3	-	2	2	-	2	-	3	3	3
CO2	3	3	2	2	2	3	-	2	2	-	2	-	3	3	3
CO3	3	3	3	2	3	3	-	2	2	-	2	-	3	3	3
CO4	3	3	3	3	3	3	2	3	2	-	2	2	3	3	3
CO5	3	3	3	3	3	3	2	2	3	-	2	2	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS / Civil

23EST31

ENTREPRENEURSHIP AND STARTUP
(Common to: B.E / B.Tech. all Branches)

L	T	P	C
1	0	0	1

Course Objectives:

The main learning objective of this course is to prepare the students :

- To develop a knowledge on basic concepts of entrepreneurship.
- To know about business opportunities and project evaluation criteria.
- To explore the concept of startups, government schemes and other financial institutions support

UNIT-I

ENTREPRENEURSHIP CONCEPTS

5

Entrepreneurship-Meaning-Origin-Functions-Factors Affecting Entrepreneurial Growth- - Role of Entrepreneurship in Economic Development- Skills required for an Entrepreneur - Barriers to Entrepreneurship - Stages in Entrepreneurial Process.

UNIT-II

PROJECT FORMULATION AND IDENTIFICATION

5

Identification of business opportunities -Project formulation- Project Classification and Identification - Project Objectives - Technical Analysis, Financial Analysis – Environmental Appraisal of Project - EDP Phases - Project Report Preparation.

UNIT-III

START UP OPPORTUNITIES AND FINANCE

5

The New Industrial Revolution- Business Start-up - Rise of the startup Economy- Government Initiatives - Government schemes and incentives - Institutional service to entrepreneur - Sources of Finance.

TOTAL : 15 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1:** Enhanced the knowledge of entrepreneurship qualities and skills to startup a business.
- CO2:** Understand the project classification and prepare a feasibility report.
- CO3:** Provide vision for the own Start-up and its importance for economic development.


TEXT BOOKS:

1. Gupta C.B and Srinivasan N.P- Entrepreneurial development-Sultan Chand and Sons- Latest edition.
2. Khanka S.S.-Entrepreneurial Development-S.Chand& Co, RamNagar, New Delhi, Latest edition.

REFERENCE BOOKS:

1. Vasant Desai-Project Management and Entrepreneurship-Himalaya Publishing House,2023
2. P.Narayana Reddy – Entrepreneurship Text and Cases- cengage learning.2022
3. Prasanna Chandra- Projects planning, analysis, selection, implementation and review Tata McGraw-Hill Publishing Co, Latest edition.
4. Donald F.Kuratko- Entrepreneurship theory, process & practice-9th Edition-Cengage Learning,2022.

SVHEC-R2023


Chairman
BoS / MBA

E-RESOURCES:

1. http://nptel.ac.in/courses/122106032/Pdf/7_2.pdf, "Business Plan", Dr. T. J. Kamalanabhan, Indian Institute of Technology Madras.
2. <http://www.nptel.ac.in/syllabus/110104049/>, "Entrepreneurial Finance", Dr. B.V. Phani, IIT Kanpur.
3. http://nptel.ac.in/noc20_mg35/ Entrepreneurship and Start up

CO, PO & PSO's MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	-	1	-	-	-	-	-	-	-	3	2	2
CO2	2	3	1	3	-	-	-	-	-	-	-	-	2	1	2
CO3	1	-	3	2	2	-	-	-	-	-	-	-	1	3	2
Avg	2	2	2	1.6	1	-	-	-	-	-	-	-	2	2	2

1-low, 2-medium, 3- high, '-'-no correction

23CEL31

SURVEYING AND LEVELLING LABORATORY

L	T	P	C
0	0	3	1.5

COURSE OBJECTIVES:

- To know basic surveying instruments like chain/tape, compass and levelling instruments
- To understand use levelling instrument for surveying operations
- To recognize theodolite for various surveying operations
- To carry out necessary surveys for social infrastructures
- To prepare planimetric maps

LIST OF EXPERIMENTS**Chain Survey**

1. Study of chains and its accessories, Aligning, Ranging, Chaining and Marking Perpendicular offset
2. Setting out works – Foundation marking using tapes single Room and Double Room

Compass Survey

3. Compass Traversing – Measuring Bearings & arriving included angles

Levelling - Study of levels and levelling staff

4. Fly levelling using Dumpy level & Tilting level
5. Check levelling Theodolite

Study of Theodolite

6. Measurements of horizontal angles by reiteration and repetition and vertical angles
7. Determination of elevation of an object using single plane method when base is Accessible/inaccessible.

Tacheometry – Tangential system – Stadia system

8. Determination of Tacheometric Constants
9. Heights and distances by stadia Tacheometry
10. Heights and distances by Tangential Tacheometry

Total Station - Study of Total Station, Measuring Horizontal and Vertical angles

11. Traverse using Total station and Area of Traverse
12. Determination of distance and difference in elevation between two inaccessible points using Total station

TOTAL : 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- C01 :** Impart knowledge on the usage of basic surveying instruments like chain/tape, compass and levelling instruments
- C02 :** Able to use levelling instrument for surveying operations
- C03 :** Able to use theodolite for various surveying operations
- C04 :** Able to carry out necessary surveys for social infrastructures
- C05 :** Able to prepare planimetric maps

REFERENCE BOOK:

1. SVHEC- Surveying and Levelling Laboratory Manual.

CO's – PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	3	2	3	3	2	3	2	3	3	3	3	1	3	3	3
C02	3	2	3	3	3	3	3	3	3	3	3	1	3	3	3
C03	3	1	2	-	3	2	-	-	3	-	-	2	3	3	3
C04	3	3	2	-	2	3	3	2	3	3	3	1	3	3	3
C05	3	3	3	2	2	3	3	2	3	3	3	1	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS / Civil

23CEL32

WATER AND WASTEWATER ANALYSIS LABORATORY

L	T	P	C
0	0	3	1.5

COURSE OBJECTIVES:

- To Calibrate and standardize the equipment
- To Collect proper sample for analysis
- To know the sample preservation methods
- To perform field oriented testing of water, wastewater
- To perform coliform analysis

LIST OF EXPERIMENTS

ANALYSIS OF WATER SAMPLE

1. Sampling and preservation methods for water and wastewater (Demonstration only)
2. Measurement of Electrical conductivity and turbidity
3. Determination of fluoride in water by spectrophotometric method /ISE
4. Determination of iron in water (Demo)
5. Determination of Sulphate in water
6. Determination of Optimum Coagulant Dosage by Jar test apparatus
7. Determination of available Chlorine in Bleaching powder and residual chlorine in water

ANALYSIS OF WASTEWATER SAMPLE

8. Estimation of suspended, volatile and fixed solids
9. Determination of Sludge Volume Index in waste water
10. Determination of Dissolved Oxygen
11. Estimation of B.O.D.
12. Estimation of C.O.D.
13. Determination of TKN and Ammonia Nitrogen in wastewater
14. Determination of total and faecal coliform (Demonstration only)

TOTAL : 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1 :** Calibrate and standardize the equipment
- CO2 :** Collect proper sample for analysis
- CO3 :** Know the sample preservation methods
- CO4 :** Perform field oriented testing of water, wastewater
- CO5 :** Perform coliform analysis

REFERENCE BOOK:

1. SVHEC- Water and Wastewater Analysis Laboratory Manual.

CO's - PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	1	1	1	2	1	2	2	1	1	1	3	1	2	2
CO2	2	1	1	1	1	2	2	2	1	1	2	3	2	2	2
CO3	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2
CO4	3	3	3	3	3	2	2	3	3	2	3	2	3	3	3
CO5	2	3	3	3	3	2	2	2	2	2	2	3	2	2	2

1 - low, 2 - medium, 3 - high, '-' - no correlation

dy
**Chairman
BoS / Civil**

23CET41**APPLIED HYDRAULICS ENGINEERING**

L	T	P	C
3	1	0	4

COURSE OBJECTIVES:

- To know basics of open channel flow, its classification and analysis of uniform flow in steady state conditions with specific energy concept and its application
- To Analyse steady gradually varied flow, water surface profiles and its length calculation using direct and standard step methods with change in water surface profiles due to change in grades.
- To Derive the relationship among the sequent depths of steady rapidly varied flow and estimating energy loss in hydraulic jump with exposure to positive and negative surges
- To Design turbines and explain the working principle
- To Differentiate pumps and explain the working principle with characteristic curves and design centrifugal and reciprocating pumps

UNIT-I**UNIFORM FLOW****9+3**

Definition and differences between pipe flow and open channel flow - Types of Flow - Properties of open channel - Fundamental equations - Sub-critical, Super-critical and Critical flow - Velocity distribution in open channel - Steady uniform flow: Chezy's equation, Manning equation - Best hydraulic sections for uniform flow - Computation in Uniform Flow - Specific energy and specific force.

UNIT-II**VARIED FLOWS****9+3**

Dynamic equations of gradually varied - Water surface flow profile classifications: Hydraulic Slope, Hydraulic Curve - Profile determination by Numerical method: Direct step method and Standard step method - Change in Grades.

UNIT-III**RAPIDLY VARIED FLOWS****9+3**

Application of the momentum equation for RVF - Hydraulic jumps - Types - Energy dissipation - Positive and Negative surges.

UNIT-IV**TURBINES****9+3**

Turbines - Classification - Impulse turbine - Pelton wheel - Reaction turbines - Francis turbine - Kaplan turbine - Draft tube - Cavitation - Performance of turbine - Specific speed - Runaway speed - Minimum Speed to start the pump.

UNIT-V**PUMPS****9+3**

Centrifugal pumps - Minimum speed to start the pump - NPSH - Cavitation's in pumps - Operating characteristics - Multistage pumps - Reciprocating pumps - Negative slip - Indicator diagrams and its variations - Air vessels - Savings in workdone

TOTAL : 60 PERIODS**COURSE OUTCOMES:**

At the end of the course the students will be able to

- C01 :** Describe the basics of open channel flow, its classification and analysis of uniform flow in steady state conditions with specific energy concept and its application
Analyse steady gradually varied flow, water surface profiles and its length calculation
- C02 :** using direct and standard step methods with change in water surface profiles due to change in grades.
- C03 :** Derive the relationship among the sequent depths of steady rapidly varied flow and estimating energy loss in hydraulic jump with exposure to positive and negative surges
- C04 :** Design turbines and explain the working principle
- C05 :** Differentiate pumps and explain the working principle with characteristic curves and design centrifugal and reciprocating pumps.

TEXT BOOKS:

1. Jain. A.K., Fluid Mechanics, Khanna Publishers, Delhi, 2010.
2. Chandramouli P N, Applied Hydraulic Engineering, Yes Dee Publisher, 2017

REFERENCE BOOKS:

1. Ven Te Chow, Open Channel Hydraulics, McGraw Hill, New York, 2009.
2. Modi P.N. and Seth S.M., Hydraulics and Fluid Mechanics, Standard Book House, New Delhi, 19th edition, 2013.
3. Mays L.W., Water Resources Engineering, John Wiley and Sons (WSE), New York, 2019
4. Subramanya K., Flow in open channels, Tata McGraw Hill, New Delhi, 2019.

E-RESOURCES:

1. <https://archive.nptel.ac.in/courses/105/105/105105203/>
2. <https://nptel.ac.in/courses/105103096>

CO's - PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	3	2	3	1	2	2	1	2	1	1	3	3	2	2
CO2	3	3	2	3	2	2	2	1	2	1	1	3	3	2	2
CO3	3	3	2	3	1	2	2	1	2	1	1	3	3	2	3
CO4	3	3	3	3	1	2	2	1	2	1	1	3	3	2	3
CO5	3	3	3	3	1	2	2	1	2	1	1	3	3	2	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

Deep
Chairman
BoS / Civil

23CET42

STRENGTH OF MATERIALS

L	T	P	C
2	1	0	3

COURSE OBJECTIVES:

- To learn the fundamental concepts of Stress in simple and complex states
- To know the mechanism of load transfer in beams
- To induced stresses due to simple bending and unsymmetrical bending
- To determine the deformation in determinate beams
- To Know the basic concepts of analysis of indeterminate beams.

UNIT-I

SIMPLE AND COMPOUND STRESSES

9

Stresses in simple and compound bars – Thermal stresses – Elastic constants - Thin cylindrical and spherical shells – Biaxial state of stress – Principal stresses and principal planes – Mohr's circle of stresses - Torsion on circular shafts

UNIT-II

TYPES OF BEAMS & BENDING

9

Types of beams and transverse loadings– Shear force and bending moment for simply supported, cantilever and over-hanging beams - Theory of simple bending – Bending stress distribution – Shear stress distribution.

UNIT-III

DEFLECTION OF BEAMS

8

Double Integration method – Macaulay's method – Area moment method – Conjugate beam method - Strain energy method for determinate beams

UNIT-IV

INDETERMINATE BEAMS

10

Propped Cantilever and Fixed Beams – Fixed end moments reactions, slope and deflection for standard cases of loading — Continuous beams – support reactions and moments – Theorem of three moments – Shear Force and Bending Moment Diagrams.

UNIT-V

ADVANCED TOPICS

9

Thin & Thick cylinders - Theories of failure – Principal stress, principal strain, shear stress, strain energy and distortion energy theories – application problems.

TOTAL : 45 PERIODS

Prof.
Chairman
BoS / Civil

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1 :** Understand the concepts of stress and strain, principal stresses and principal planes
- CO2 :** Determine Shear force and bending moment in beams and understand concept of theory of simple bending.
- CO3 :** Calculate the deflection of beams by different methods and selection of method for determining slope or deflection
- CO4 :** Analyze propped cantilever, fixed beams and continuous beams for external loadings and support settlements
- CO5 :** Determine the stresses due to Unsymmetrical bending of beams, locate the shear center, and study the various theories of failure

TEXT BOOKS:

1. Rajput R.K. "Strength of Materials (Mechanics of Solids)", S.Chand & company Ltd., New Delhi, 2018.
2. Rattan.S.S., "Strength of Materials", Tata McGraw Hill Education Pvt. Ltd., New Delhi, 2017.
3. Punmia B.C., Ashok Kumar Jain and Arun Kumar Jain, "Theory of Structures" (SMTS) Vol -II, Laxmi Publishing Pvt Ltd, New Delhi 2017.
4. Basavarajiah and Mahadevapa, Strength of Materials, University press, Hyderabad, 2016
5. Vazirani.V.N, Ratwani.M.M, Duggal .S.K Analysis of Structures: Analysis, Design and Detailing of Structures-Vol.1, Khanna Publishers, New Delhi 2014.

REFERENCE BOOKS:

1. Kazimi S.M.A, "Solid Mechanics", Tata McGraw-Hill Publishing Co., New Delhi, 2017
2. William A .Nash, "Theory and Problems of Strength of Materials", Schaum's Outline Series, Tata McGraw Hill Publishing company, 2017.
3. Singh. D.K., " Strength of Materials", Ane Books Pvt. Ltd., New Delhi, 2021
4. Egor P Popov, "Engineering Mechanics of Solids", 2nd edition, PHI Learning Pvt. Ltd., New Delhi, 2015
5. Irwing H.Shames, James M.Pitarresi, Introduction to Solid Mechanics, Prentice Hall of India, New Delhi, 2002
6. Beer. F.P. &Johnston.E.R. "Mechanics of Materials", Tata McGraw Hill, Sixth Edition, New Delhi 2010.
7. James M.Gere., Mechanics of Materials, Thomas Canada Ltd., Canada, 2006.
8. Egor. P.Popov, Engineering Mechanics of Solids, Prentice Hall of India, Second Edition New Delhi 2015.

E-RESOURCES:

1. <https://nptel.ac.in/courses/112107146>
2. <https://archive.nptel.ac.in/courses/105/105/105105108/>

CO's - PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3
C02	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3
C03	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3
C04	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3
C05	3	3	3	3	2	3	1	3	2	3	1	3	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS / Civil

23CET43

CONCRETE TECHNOLOGY

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To study the properties of concrete making materials.
- To have better knowledge about the chemical and mineral admixtures in concrete.
- To know the importance and applications of special concretes
- To familiarize with the IS method of mix design as per the latest code.
- To understand the fresh and hardened properties of concrete.

UNIT-I

CONSTITUENT MATERIALS

9

Cement-Different types-Chemical composition and Properties -Tests on cement-IS Specifications-Aggregates-Classification-Mechanical properties and tests as per BIS Grading requirements-Water-Quality of water for use in concrete.

UNIT-II

CHEMICAL AND MINERAL ADMIXTURES

9

Accelerators-Retarders- Plasticisers- Super plasticizers-Water proofers - Mineral Admixtures like Fly Ash, Silica Fume, Ground Granulated Blast Furnace Slag and Metakaoline -Their effects on concrete properties

UNIT-III

FRESH AND HARDENED PROPERTIES OF CONCRETE

9

Workability-Tests for workability of concrete-Slump Test and Compacting factor Test-Segregation and Bleeding-Determination of Compressive and Flexural strength as per BIS, ACI METHOD AND IS10262-2009 CODE - Properties of Hardened concrete- Stress-strain curve for concrete-Determination of Modulus of elasticity – Durability of concrete.

UNIT-IV

SPECIAL CONCRETES

9

Light weight concretes - High strength concrete - Fibre reinforced concrete – Ferrocement - Ready mix concrete – SIMCON - SIFCON - Shotcrete – Polymer concrete - High performance concrete- self compacting concrete - Geopolymer Concrete.

UNIT-V

PROPORTIONING OF CONCRETE MIX

9

Principles of Mix Proportioning-Properties of concrete related to Mix Design-Physical properties of materials required for Mix Design - Design Mix and Nominal Mix-BIS Method of Mix Design - Mix Design Examples

TOTAL : 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1 :** Understand the requirements of cement, aggregates and water for concrete
- CO2 :** Select suitable admixtures for enhancing the properties of concrete
- CO3 :** Determine the properties of concrete at fresh and hardened state.
- CO4 :** Know the importance of special concretes for specific requirements
- CO5 :** Design concrete mixes as per IS method of mix design

TEXT BOOKS:

1. Gupta.B.L., Amit Gupta, "Concrete Technology", Jain Book Agency, 2010.
2. Shetty,M.S, "Concrete Technology", S.Chand and Company Ltd, New Delhi, 2003

REFERENCE BOOKS:

1. Neville, A.M; "Properties of Concrete", Pitman Publishing Limited, London,1995
2. Gambhir.M.L. Concrete Technology, Fifth Edition, McGraw Hill Education,2017.
3. Job Thomas., Concrete Technology, Cengage learning India Private Ltd, New Delhi, 2015.
4. IS10262-2019 Recommended Guidelines for Concrete Mix Design, Bureau of Indian Standards, New Delhii.

E-RESOURCES:

1. <https://archive.nptel.ac.in/courses/105/102/105102012/>
2. <https://archive.nptel.ac.in/courses/105/104/105104030/>

CO's – PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	1	1	2	1	3	3	2	1	1	1	2	3	2	3
CO2	3	1	1	1	1	3	3	1	1	1	1	2	3	2	3
CO3	3	2	3	3	1	3	3	1	1	1	1	2	3	2	3
CO4	3	1	1	1	1	3	3	2	1	1	1	2	3	2	3
CO5	3	1	1	1	1	3	3	2	1	1	2	2	3	2	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

dy.
Chairman
BoS / Civil

23CET44

SOIL MECHANICS

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To impart knowledge to classify the soil based on index properties
- To assess their engineering properties based on the classification.
- To familiarize the students about the fundamental concepts of compaction, flow through soil, stress transformation, stress distribution, consolidation and shear strength of soils.
- To show the understanding of shear strength of soils and its impact of engineering solutions to the loaded soil medium and also will be aware of contemporary issues on shear strength of soils.
- To impart knowledge of design of both finite and infinite slopes.

UNIT-I

SOIL CLASSIFICATION AND COMPACTION

9

Formation of soil - Soil description - Particle - Size shape and colour - Composition of gravel, sand, silt, clay particles - Particle behaviour - Soil structure - Phase relationship - Index properties - Significance - BIS classification system - Unified classification system - Compaction of soils - Theory, Laboratory and field tests - Field Compaction methods - Factors influencing compaction of soils.

UNIT-II

EFFECTIVE STRESS AND PERMEABILITY

9

Soil - water - Static pressure in water - Effective stress concepts in soils - Capillary phenomena- Permeability interaction - Hydraulic conductivity - Darcy's law - Determination of Hydraulic Conductivity - Laboratory Determination (Constant head and falling head methods) and field measurement pumping out in unconfined and confined aquifer - Factors influencing permeability of soils - Seepage - Two dimensional flow - Laplace's equation - Introduction to flow nets - Simple problems. (Sheet pile and weir).

UNIT-III

STRESS DISTRIBUTION AND SETTLEMENT

9

Stress distribution in homogeneous and isotropic medium - Boussinesq theory - (Point load, Line load and udl) Use of New marks influence chart -Components of settlement -- Immediate and consolidation settlement - Terzaghi's one dimensional consolidation theory - Computation of rate of settlement. - \sqrt{t} and $\log t$ methods- e - $\log p$ relationship.

dyf.
Chairman
BoS / Civil

UNIT-IV

SHEAR STRENGTH

9

Shear strength of cohesive and cohesion less soils – Mohr-Coulomb failure theory – Measurement of shear strength - Direct shear, Triaxial compression, UCC and Vane shear tests – Pore pressure parameters – Cyclic mobility – Liquefaction.

UNIT-V

SLOPE STABILITY

9

Stability Analysis - Infinite slopes and finite slopes – Total stress analysis for saturated clay – Friction circle method – Use of stability number – Method of slices – Fellenious and Bishop's method - Slope protection measures.

TOTAL : 45 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- C01 :** Demonstrate an ability to identify various types of soils and its properties, formulate and solve engineering Problems
- C02 :** Show the basic understanding of flow through soil medium and its impact of engineering solution
- C03 :** Understand the basic concept of stress distribution in loaded soil medium and soil settlement due to consolidation
Show the understanding of shear strength of soils and its impact of engineering solutions
- C04 :** to the loaded soil medium and also will be aware of contemporary issues on shear strength of soils.
- C05 :** Demonstrate an ability to design both finite and infinite slopes, component and process as per needs and specifications

TEXT BOOKS:

1. Murthy, V.N.S., "Soil Mechanics and Foundation Engineering", CBS Publishers Distribution Ltd., New Delhi. 2015
2. Gopal Ranjan and Rao, A.S.R., "Basic and Applied Soil Mechanics", New Age Ltd. International Publisher New Delhi (India) 2006.


Chairman
BoS / Civil

REFERENCE BOOKS:

1. McCarthy, D.F., "Essentials of Soil Mechanics and Foundations". Prentice-Hall, 2006.
2. Coduto, D.P., "Geotechnical Engineering – Principles and Practices", Prentice Hall of India Pvt.Ltd. New Delhi, 2010.
3. Das, B.M., "Principles of Geotechnical Engineering". Brooks / Coles / Thompson Learning Singapore, 8th Edition, 2013.
4. Punmia, B.C., "Soil Mechanics and Foundations", Laxmi Publications Pvt. Ltd. New Delhi, 2005.

E-RESOURCES:

1. <https://nptel.ac.in/courses/105103097>
2. <https://archive.nptel.ac.in/courses/105/105/105105168/>

CO's – PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	3	2	2	3	1	1	1	2	1	2	3	3	3	2
CO2	3	2	3	2	3	1	1	1	2	1	2	3	2	2	3
CO3	3	3	2	2	2	2	1	1	2	1	2	3	2	2	3
CO4	2	3	3	2	2	1	1	1	1	1	2	3	2	2	3
CO5	3	3	2	2	2	1	1	1	1	1	1	3	2	3	2

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS / Civil

23CET45

HIGHWAY AND RAILWAY ENGINEERING

L	T	P	C
3	0	0	3

COURSE OBJECTIVES:

- To Plan a highway according to the principles and standards adopted in various institutions in India.
- To Design the geometric features of road network and components of pavement.
- To Test the highway materials and construction practice methods and know its properties and able to perform pavement evaluation and management.
- To Understand the methods of route alignment and design elements in railway planning and constructions.
- To Understand the construction techniques and maintenance of track laying and railway stations

UNIT-I

HIGHWAY ENGINEERING

9

Classification of highways – Institutions for Highway planning, design and construction at different levels – factors influencing highway alignment – Typical cross sections of Urban and Rural roads – Engineering surveys for alignment- Conventional and Modern method

UNIT-II

DESIGN OF HIGHWAY ELEMENTS

9

Cross sectional elements – Horizontal curves, super elevation, transition curves, widening of curves – Sight distances – Vertical curves, gradients– pavement components and their role - Design practice for flexible and rigid pavements (IRC methods only).

UNIT-III

HIGHWAY CONSTRUCTION AND MAINTENANCE

9

Highway construction materials, properties, testing methods – Construction practice of flexible and rigid pavement- Highway drainage – Evaluation and Maintenance of pavements

UNIT-IV

RAILWAY PLANNING AND CONSTRUCTION

9

Elements of permanent way – Rails, Sleepers, Ballast, rail fixtures and fastenings, Selection of gauges - Track Stress, coning of wheels, creep in rails, defects in rails – Route alignment surveys, conventional and modern methods-Geometric design of railway, gradient, super elevation, widening of gauge on curves (Problems)-Railway drainage- Level Crossings-Signalling.

Prof.
Chairman
BoS / Civil

UNIT-V**RAILWAY TRACK CONSTRUCTION MAINTENANCE AND OPERATION****9**

Points and Crossings - Design of Turnouts, Working Principle-Track Circuiting - Construction & Maintenance – Conventional, Modern methods and Materials, Lay outs of Railway Stations and Yards, Rolling Stock, Tractive Power, Track Resistance - Role of Indian Railways in National Development – Railways for Urban Transportation – LRT & MRTS Feasibility study, Planning and construction.

TOTAL : 45 PERIODS**COURSE OUTCOMES:**

At the end of the course the students will be able to

- CO1 :** Plan a highway according to the principles and standards adopted in various institutions in India
- CO2 :** Design the geometric features of road network and components of pavement.
- CO3 :** Test the highway materials and construction practice methods and know its properties and able to perform pavement evaluation and management
- CO4 :** Understand the methods of route alignment and design elements in railway planning and constructions.
- CO5 :** Understand the construction techniques and maintenance of track laying and railway stations

TEXT BOOKS:

1. Khanna.S. K., Justo.C.E.G and Veeraragavan A. "Highway Engineering", Nemchand Publishers, 2014.
2. Subramanian K.P., "Highways, Railways, Airport and Harbour Engineering", Scitech Publications (India), Chennai,2010
3. Kadiyali.L.R. "Principles and Practice of Highway Engineering", Khanna Technical Publications, 6th edition Delhi, 2015.
4. C. Venkatramaiah., Transportation Engineering-Vol.2 Railways, Airports, Docks and Harbours, Bridges and Tunnels., Universities Press (India) Private Limited, Hyderabad, 2015.

REFERENCE BOOKS:

1. Indian Road Congress (IRC), Guidelines for the Design of Flexible Pavements, (Third Revision), IRC:37-2012
2. Indian Road Congress (IRC), Guidelines for the Design of Plain Jointed Rigid Pavements for Highways, (Third Revision), IRC:58-2012
3. Yang H. Huang, "Pavement Analysis and Design", Pearson Education Inc, Ninth Impression, South Asia,2012

4. Ian D. Walsh, "ICE manual of highway design and management", ICE Publishers, 1st Edition, USA, 2011
5. Fred L. Mannering, Scott S. Washburn and Walter P. Kilareski, "Principles of Highway Engineering and Traffic Analysis", Wiley India Pvt. Ltd., New Delhi, 2011
6. Garber and Hoel, "Principles of Traffic and Highway Engineering", CENGAGE Learning, New Delhi, 2010
7. O'Flaherty, C.A "Highways, Butterworth – Heinemann, Oxford, 2006
8. IRC-37-2012, The Indian roads Congress, Guidelines for the Design of Flexible Pavements, New Delhi
9. IRC 58-2012. The Indian Road Congress, Guideline for the Design of Rigid Pavements for Highways, New Delhi
10. Saxena Subhash, C. and Satyapal Arora, A Course in Railway Engineering, Dhanapat Rai and Sons, Delhi, 1998.

E-RESOURCES:

1. <https://nptel.ac.in/courses/105101087>
2. <https://archive.nptel.ac.in/courses/105/107/105107220/>

CO's – PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	3	-	-	2	-	3	1	3	-	-	-	-	3	2	-
C02	2	3	3	2	2	-	2	3	2	-	2	3	3	3	-
C03	2	3	2	2	2	3	3	3	-	-	3	3	3	3	-
C04	3	-	-	-	-	3	-	3	-	1	-	-	3	2	2
C05	-	-	3	-	2	-	-	-	2	-	-	2	3	3	3

1 - low, 2 - medium, 3 - high, '-' - no correlation

23CYT41	ENVIRONMENTAL SCIENCES AND SUSTAINABILITY	L	T	P	C
	(Common to: B.E./B.Tech. all Branches)	2	0	0	2

Course Objectives:

- To introduce the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
- To impart knowledge on the causes, effects and control or prevention measures of environmental pollution and natural disasters.
- To facilitate the understanding of global and Indian scenario of renewable and nonrenewable resources, causes of their degradation and measures to preserve them.
- To familiarize the concept of sustainable development goals and sustainable practices
- To imbibe awareness on manmade activities and population issues

UNIT-I ENVIRONMENT AND BIODIVERSITY 6
 Definition, scope and importance of environment - need for public awareness. Eco-system and Energy flow- ecological succession. Types of biodiversity - values of biodiversity, India as a mega-diversity nation - threats to biodiversity - conservation of biodiversity. Activity: Documentation of ecosystems/Biodiversity within Campus.

UNIT-II ENVIRONMENTAL POLLUTION 6
 Causes, Effects and Preventive measures of Water, Soil, Air and Noise Pollutions. Solid, Hazardous and E-Waste management. Case studies on Occupational Health and Safety Management system (OHSMS). Environmental protection, Environmental protection acts. Activity: Documentation of pollution issues in Erode district.

UNIT-III RENEWABLE SOURCES OF ENERGY 6
 Energy management and conservation - New Energy Sources: Need and different types of new energy sources. Concept, origin and applications of - Hydrogen energy, Ocean energy, Tidal energy and geothermal energy conversion. Activity: Documentation of available renewable resources in Erode district.

UNIT-IV SUSTAINABILITY AND MANAGEMENT 6
 Development, GDP, Sustainability- concept, needs and challenges - Sustainable Development Goals - Concept of Carbon Credit, Carbon Footprint. Circular economy, ISO 14000 Series, Material Life Cycle Assessment, Environmental Impact Assessment. Green Engineering. Activity: Documentation of sustainable goals of Tamilnadu.

UNIT-V HUMAN POPULATION AND DISASTER MANAGEMENT 6
 Population growth, Population explosion— Family Welfare Program - Environment and human health. Human rights - HIV/AIDS - Women and Child Welfare - Role of Information Technology in environment and human health - Disaster management: Floods, earthquake, cyclone and landslides. Activity: Documentation of women development schemes in Tamilnadu.

TOTAL :30 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to	
C01:	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.
C02:	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.
C03:	To identify and apply the understanding of renewable and non-renewable resources
C04:	To recognize the different goals of sustainable development and sustainability practices and apply them for future development.
C05:	To aware the population issues and to handle the disaster issues

TEXT BOOKS:

1. Dr. A.Ravikrishnan "Environmental Sciences and Sustainability", 2nd Edition, Sri Krishna Hitech Publishing Company Pvt. Ltd, 2022.
2. Benny Joseph, 'Environmental Science and Engineering', Tata McGraw-Hill, New Delhi, 2010.
3. Gilbert M.Masters& Wendell P Ela, 'Introduction to Environmental Engineering and Science', 3rd edition, Prentice – Hall of India Pvt. Ltd, New Delhi, 2008.

REFERENCE BOOKS:

1. Dharmendra S. Sengar, 'Environmental law', Prentice hall of India PVT. LTD, New Delhi, 2009.
2. Rajagopalan, R, 'Environmental Studies-From Crisis to Cure', Oxford University Press, Third Edition, 2022.
3. Erach Bharucha "Textbook of Environmental Studies for Undergraduate Courses" Orient Blackswan Pvt. Ltd. 2023.

E- SOURCES:

Unit 1:<https://www.youtube.com/watch?v=Ar04qG1P8Es> (IIT ROORKEE NPTEL)&<https://www.youtube.com/watch?v=SHxAOoxhKTA> (IIT KANPUR NPTEL)
Unit 2:<https://www.youtube.com/watch?v=l7Z34WU257U> (IIT ROORKEE NPTEL)
Unit 3:<https://www.youtube.com/watch?v=1kUE0BZtTRc> (NATIONAL GEOGRAPHIC)
Unit 4:<https://www.youtube.com/watch?v=Crd3CFq5B4s> (IITM NPTEL)
Unit 5:<https://www.youtube.com/watch?v=sMqtwbKc8EA> (FINANCIAL TIMES)

Shree Venkateshwara Hi-Tech Engineering College (Autonomous)

CO's& PO's MAPPING:

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	2	1	-	-	-	2	3	-	-	-	-	2
C02	3	2	-	-	-	3	3	-	-	-	-	2
C03	3	-	1	-	-	2	2	-	-	-	-	2
C04	3	2	1	1	-	2	2	-	-	-	-	2
C05	3	2	1	-	-	2	2	-	-	-	-	1
AVG	3	2	1	1	-	2	2	-	-	-	-	2

1- low,2-medium,3-high, '-'- nocorrelation

23CEL41

HYDRAULIC ENGINEERING LABORATORY**L T P C**

0 0 3 1.5

COURSE OBJECTIVES:

- To Apply Bernoulli equation for calibration of flow measuring devices.
- To Measure friction factor in pipes and compare with Moody diagram
- To determine the performance characteristics of roto-dynamic pumps.
- To determine the performance characteristics of positive displacement pumps.
- To determine the performance characteristics of turbines.

LIST OF EXPERIMENTS**A. FLOW MEASUREMENT**

1. Calibration of Rotameter
2. Flow through Orifice meter/mouthpiece, Venturimeter and Notches
3. Bernoulli's Experiment

B. LOSSES IN PIPES

4. Determination of friction factor in pipes.
5. Determination of minor losses

C. PUMPS

6. Characteristics of Centrifugal pumps
7. Characteristics of Gear pump
8. Characteristics of Submersible pump
9. Characteristics of Reciprocating pump

D. TURBINES

10. Characteristics of Pelton wheel turbine
11. Characteristics of Francis turbine

E. DETERMINATION OF METACENTRIC HEIGHT

12. Determination of metacentric height of floating bodies.

TOTAL : 45 PERIODS**COURSE OUTCOMES:****At the end of the course the students will be able to**

- C01:** Apply Bernoulli equation for calibration of flow measuring devices
- C02:** Measure friction factor in pipes and compare with Moody diagram
- C03:** Determine the performance characteristics of roto - dynamic pumps
- C04:** Determine the performance characteristics of positive displacement pumps.
- C05:** Determine the performance characteristics of turbines.

REFERENCE BOOK:

1. SVHEC- Hydraulic Engineering Laboratory Manual.

CO's - PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	2	2	1	3	1	2	2	1	2	1	1	2	2	1	1
CO2	3	2	1	3	1	2	2	1	2	1	1	2	3	1	1
CO3	3	3	2	3	1	2	2	1	3	1	1	2	3	2	1
CO4	3	3	2	3	1	2	2	1	3	1	1	2	3	2	1
CO5	3	3	2	3	1	2	2	1	3	1	1	2	3	2	1

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS / Civil

23CEL42

MATERIALS TESTING LABORATORY

L	T	P	C
0	0	4	2

COURSE OBJECTIVES:

- To determine the mechanical properties of steel.
- To determine the physical properties of cement
- To determine the physical properties of fine and coarse aggregate.
- To determine the workability and compressive strength of concrete.
- To determine the strength of brick and wood.

LIST OF EXPERIMENTS

I. TESTS ON METALS

- a) Tension test on steel rod
- b) Torsion test on mild steel rod
- c) Deflection test on metal beam
- d) Double shear test on metal
- e) Impact test on metal specimen (Izod and Charpy)
- f) Hardness test on metals (Rockwell and Brinell Hardness Tests)
- g) Compression test on helical spring
- h) Deflection test on carriage spring

II. TESTS ON CEMENT

- a) Determination of fineness of cement
- b) Determination of consistency of cement
- c) Determination of specific gravity of cement
- d) Determination of initial and final setting time of cement

III. TESTS ON FINE AGGREGATE

- a) Determination of specific gravity and water absorption of fine aggregate
- b) Determination of grading of fine aggregate
- c) Determination of water absorption for fine aggregate

IV. TESTS ON COARSE AGGREGATE

- a) Determination of compacted and loose bulk density of coarse aggregate
- b) Determination of impact value of coarse aggregate
- c) Determination of elongation index of coarse aggregate
- d) Determination of flakiness index of coarse aggregate
- e) Determination of aggregate crushing value of coarse aggregate

- f) Determination of specific gravity and water absorption of coarse aggregate

V. TESTS ON BRICKS

- a) Determination of compressive strength of bricks
b) Determination of water absorption of bricks
c) Determination of efflorescence of bricks

VI. TESTS ON CONCRETE

- a) Determination of slump of concrete
b) Determination of compressive strength of concrete
c) Determination of flowability of self-compacting concrete (Demo only)
d) Determination of Modulus of Elasticity.

VII. TEST ON WOOD

- a) Determination of Compression test on wood

TOTAL : 60 PERIODS

COURSE OUTCOMES:

At the end of the course the students will be able to

- C01 :** Determine the mechanical properties of steel.
C02 : Determine the physical properties of cement
C03 : Determine the physical properties of fine and coarse aggregate
C04 : Determine the workability and compressive strength of concrete.
C05 : Determine the strength of brick and wood.

REFERENCE BOOK:

1. SVHEC- Statistical Analysis for Construction Engineers Laboratory Manual.

CO's - PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	2	2	1	3	1	2	2	1	3	1	1	2	2	2	2
C02	3	2	1	3	1	2	2	1	3	1	1	2	3	2	2
C03	3	3	2	3	1	2	2	1	3	1	1	2	3	2	2
C04	3	3	2	3	1	2	2	1	3	1	1	2	3	2	2
C05	3	3	2	3	2	2	2	1	3	1	1	2	3	2	2

1 - low, 2 - medium, 3 - high, '-' - no correlation

23CEL43

SOIL MECHANICS LABORATORY

L	T	P	C
0	0	3	1.5

COURSE OBJECTIVES:

- To Conduct tests to determine the index properties of soils
- To determine the insitu density
- To determine the compaction characteristics.
- To Understand the various tests on Geosynthetics.
- To Conduct tests to determine the compressibility, permeability and shear strength of soils

LIST OF EXPERIMENTS

1. DETERMINATION OF INDEX PROPERTIES

Specific gravity of soil solids

- a) Grain size distribution – Sieve analysis
- b) Grain size distribution - Hydrometer analysis
- c) Liquid limit and Plastic limit tests
- d) Shrinkage limit and Differential free swell tests

2. DETERMINATION OF INSITU DENSITY AND COMPACTION CHARACTERISTICS

- a) Field density Test (Sand replacement method)
- b) Determination of moisture – density relationship using standard proctor compaction test.

3. DETERMINATION OF ENGINEERING PROPERTIES

- a) Permeability determination (constant head and falling head methods)
- b) One dimensional consolidation test (Determination of co-efficient of consolidation only)
- c) Direct shear test in cohesion less soil
- d) Unconfined compression test in cohesive soil
- e) Laboratory vane shear test in cohesive soil
- f) Tri-axial compression test in cohesion less soil (Demonstration only)
- g) California Bearing Ratio Test

4. TEST ON GEOSYNTHETICS (Demonstration only)

- a) Determination of tensile strength and interfacial friction angle.
- b) a. Determination of apparent opening sizes and permeability.

TOTAL : 45 PERIODS


Chairman
BoS / Civil

COURSE OUTCOMES:

At the end of the course the students will be able to

CO1 : Conduct tests to determine the index properties of soils

CO2 : Determine the insitu density

CO3 : Determine the compaction characteristics

CO4 : Understand the various tests on Geosynthetics

CO5: Conduct tests to determine the compressibility, permeability and shear strength of soils

REFERENCE BOOK:

1. SVHEC- Soil Mechanics Laboratory Manual.

CO's - PO's & PSO's MAPPING

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
C01	2	2	1	3	1	2	2	1	3	1	1	2	2	2	2
C02	3	2	1	3	1	2	2	1	3	1	1	2	3	2	2
C03	3	3	2	3	1	2	2	1	3	1	1	2	3	2	2
C04	3	3	2	3	1	2	2	1	3	1	1	2	3	2	2
C05	3	3	2	3	2	2	2	1	3	1	1	2	3	2	2

1 - low, 2 - medium, 3 - high, '-' - no correlation


Chairman
BoS / Civil

23MDC41

SOFT SKILLS AND ANALYTICAL SKILLS - I

(Common to: B.E. / B.Tech. all Branches)

L	T	P	C
1	0	0	0

COURSE OBJECTIVES:

- To make the students aware of critical thinking.
- To understand the significance of emotional intelligence in self-growth.
- Basic Knowledge about the Arithmetic Ability.
- Understand the basics of Data Interpretation.
- Basic Knowledge about the Analogy.

UNIT-I

CRITICAL THINKING

3

Active Listening - Analytical Thinking - Open-mindedness - Creative Thinking.

UNIT-II

EMOTIONAL INTELLIGENCE

3

Transactional analysis - Empathy - Sympathy - Conflict management.

UNIT-III

ARITHMETIC ABILITY

3

Vedic maths - BODMAS - Fractions - Divisibility rules - LCM & GCD (HCF).

UNIT-IV

DATA INTERPRETATION

3

Line Graphs - Venn diagrams - Tabulation - Pie Charts.

UNIT-V

ANALOGY

3

Coding & Decoding - Puzzle - Paper Cutting & Folding - Mirror Images.

TOTAL : 15PERIODS

P. Q. W.

COURSE OUTCOMES:

At the end of the course the students will be able to

- CO1:** Analyze and evaluate arguments and identify most common fallacies.
- CO2:** Discover personal competence and techniques of building emotional intelligence.
- CO3:** Enhance the Aptitude Round Clearing ability in interview process.
- CO4:** Interrupt the data.
- CO5:** Enhance the Analogy Round Clearing ability in interview process.

TEXT BOOKS:

1. Soft Skills: an Integrated Approach to Maximise Personality, Gajendra S. Chauhan, Sangeeta Sharma, Wiley India.
2. Quantitative Aptitude for Competitive Examination by R.S. Agrawal, S.Chand Publications.

REFERENCE BOOKS:

1. Personality Development and Soft Skills, Barun K. Mitra, Oxford Press
2. Communication Skills for Engineers and Scientists, Sharma, Sangeeta & Binod Mishra., PHI India. (2 nd edition).
3. Analytical skills by Showick Thorpe, published by S Chand And Company Limited, Ramnagar, New Delhi-110055.
4. Quantitative Aptitude and Reasoning by R V Praveen, PHI publishers.
5. Quantitative Aptitude for Competitive Examination by AbhijitGuha, Tata Mc Graw Hill Publications.

E - RESOURCES:

1. <https://infotricks1on1.blogspot.com>
2. <https://www.ambitionbox.com>